# DIA RUBBER WORLD



NOVEMBER 1, 1941

# 1931 · NEOPRENE · 1941

1931 In Akron, Ohio, on the second day of November, three Du Pont chemists announced the development of a new synthetic rubber at a meeting of the Rubber Division of the American Chemical Society. They said, "Compared with natural rubber, this new synthetic rubber is more dense, more resistant to absorption or penetration by water, less strongly swelled by petroleum hydrocarbons and less permeable to gases. It is much more resistant to attack by oxygen, ozone, hydrogen chloride, hydrogen fluoride and many other chemicals."

In New York the price of rubber had fallen to 5¢ a pound. No one was interested in synthetic rubber tires. The samples of this new synthetic rubber displayed at the meeting in Akron had an offensive odor and were inferior to natural rubber in resistance to abrasive wear and certain other physical properties. Many of the rubber specialists present felt that these disadvantages outweighed its superior resistance to oils and chemicals. Not even the Du Pont chemists who announced the discovery could predict that within two years the first American synthetic rubber tires would be made from their new product.

But they could foresee that, because of its unique properties, it would find many new uses in American Industry despite its higher cost. So certain were they that at the time of the announcement in Akron, Du Pont had already built a plant costing several hundred thousand dollars for the commercial production of this new synthetic rubber.

The discovery was hailed everywhere as a brilliant scientific achievement, but few perceived that they were witnessing the birth of a new industry—the synthetic rubber industry.

1941 Ten eventful years have passed. The synthetic rubber that was described at the Akron meeting has been improved and refined. Its odor has been removed, and the product of today now excels natural rubber not only in chemical resistance but also in resistance to abrasive wear. Neoprene is being made at the rate of over a million pounds a month, and even that production is quite inadequate. Additional plants are under construction which will increase production to 3½ million pounds a month by the fall of next year.

Thousands of engineers in all branches of industry have played a significant part in this development. Working hand in hand with Du Pont, they have adapted it to thousands of uses for which natural rubber is unsuitable. Products formerly made of rubber have been improved when made of neoprene. Airplanes, automobiles, electrical equipment, pumps, conveying machinery, power transmission equipment—in fact, hundreds of products are better and more efficient because of neoprene. Without neoprene, hundreds of mechanical devices and tools that we use in our daily living, in our industries, and in the defense of our civilization would have to revert to the designs of former years.

No one can foresee what the next ten years will bring, but one may be sure that far-sighted engineers will adapt neoprene to many more new uses in which it will contribute to the efficiency of our production methods, our personal comfort and safety.

Put these facts together . . . use your imagination . . . then write your own prophecy because . . . while neoprene is ten years old and is backed by ten years of "know-how," it's really just beginning to grow.

DU PONT

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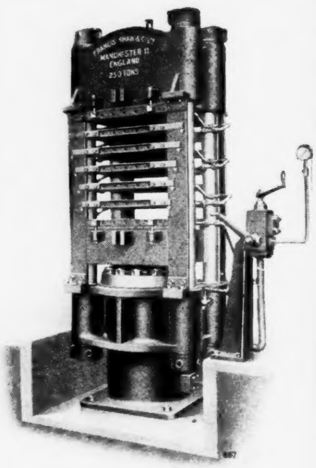

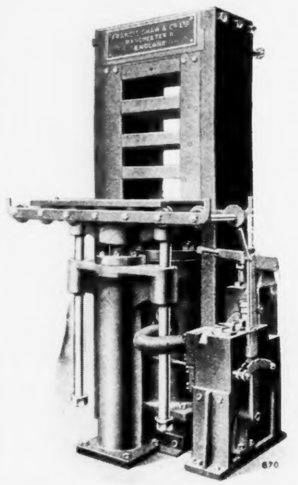

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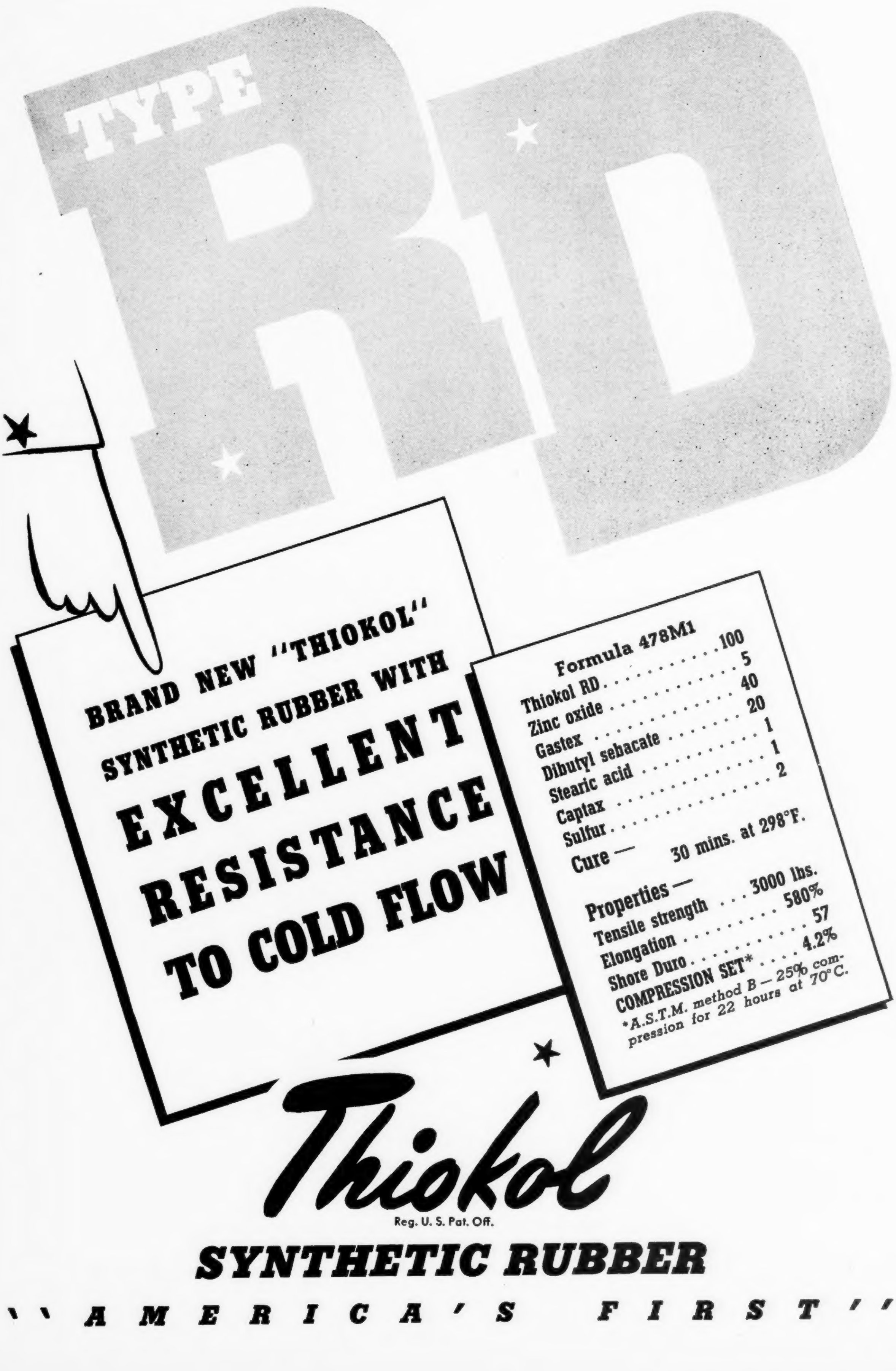
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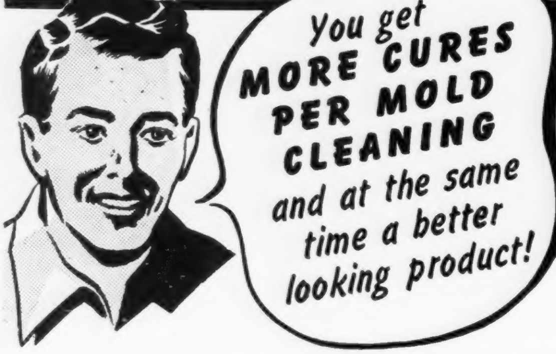


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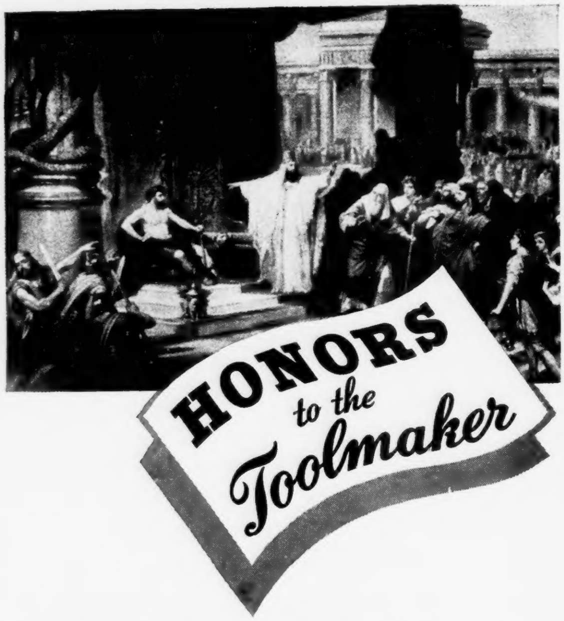
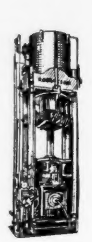
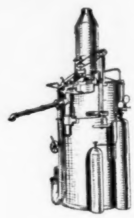



*Legend has it that when the temple of Jerusalem was completed, King Solomon gave a feast to the artificers employed in its construction. On unveiling the throne it was found that a smith had usurped the seat of honor not yet awarded, whereupon the people clamored and the guard rushed to cut him down. "Hold, let him speak!" commanded Solomon. "Thou hast, O King, invited all craftsmen but me. Yet how could these builders have raised the temple without the tools I have fashioned?" "True," decreed Solomon, "the seat is his of right." All honor to the toolmaker.*





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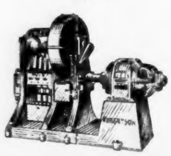

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**November 1, 1941**

**VOLUME 105** **NUMBER 2**

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# INDIA RUBBER WORLD

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# Equipment for Accelerated Light Aging of Rubber and Methods of Evaluation of Ultra-Violet Light and Sunlight[1]—I

**T. A. Werkenthin,[2] David Richardson,[3] R. F. Thornley,[4] and R. E. Morris[5]**

IN CONNECTION with the development of a suitable light aging test for evaluating the light aging properties of rubber, plastics, dyed fabrics, and paints, a considerable amount of research work and literature search was undertaken. The purpose of this article is to make readily available these data in order to facilitate additional work in the evaluation of the weathering and light aging of the above-mentioned materials. It is intended to present these data in a somewhat informal style and to set forth not only the successful experiment, but also those tests ideas which have been disproved as being either impracticable or not applicable to the particular material under investigation.

Most of the work has been done in connection with rubber compounds and synthetic rubber-like materials for the primary purpose of differentiating between satisfactory and unsatisfactory materials from the standpoint of light aging and weathering resistance. However there is a secondary purpose which, at present writing, is far more important and outweighs the mere procurement of material, and that is its use in improving the rubber-like compounds themselves.

Several years ago a standardization program was being worked out for evaluating sunlight resistance by means of exposure to natural sunlight. A questionnaire was sent out to various rubber manufacturers and interested laboratories. A tabulation of the data indicated that a number of the manufacturers were experimenting with the idea of evolving a method which would more rapidly evaluate this property and differentiate between various gradations of light aging resistance. The results of the questionnaire further indicated that there was no uniformity in the methods pursued or in the manner in which samples were exposed. For the purpose of including a light aging requirement in various government specifications, it was thought desirable to determine if standardization of some method could be effected. The use of mercury *quartz* lamps in order to obtain accelerated results of aging had been so unsatisfactory insofar as correlation with actual sunlight exposure was concerned that these attempts were essentially discontinued. Before standardization of equipment and test procedure could logically be pursued, it was essential to select some equipment which would give a reasonably constant source of light and to select some method of measuring the intensity and range of the ultra violet light used.

A comprehensive literature search of known methods of evaluating the intensity of ultra-violet light disclosed that a number of satisfactory methods were available which would estimate the total dosage of ultra-violet light to which rubber or other materials would be subjected. There were certain difficulties encountered in making this selection. One of them was that in order to determine light aging resistance of various types of rubbers, it would be desirable to determine the sensitivity curve, just as a sensitivity curve was developed for the erythemal response or sunburn effect on the human skin. Variation of the range of ultra-violet light will produce markedly different effect on the rubber samples.

The possibilities and extremes of errors in the determination which may come up in connection with correlation of sunlight and ultra-violet light can best be illustrated by a theoretical example. Suppose one has an instrument, (it does not matter whether it utilizes a photo-electric cell

EDITOR'S NOTE. This article deals with the equipment used in accelerated light aging; while the article "Light and Accelerated Light Aging of Rubber, Synthetic Rubber, and Rubber Substitutes", to appear in a forthcoming issue of *Rubber Age* (New York), treats of test results.

1 The opinions or assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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or a photo-sensitive chemical solution) which is sensitive over the range of from 2,750 to 4,000 Angstrom units; then all light within this range will produce a change proportional to the intensity of the light over all wave lengths within this range. Suppose now one has two sources of light, one of which, emitting light over a range of wave lengths between 2,750 and 3,000, is called "A." Another lamp, emitting light over a range of wave lengths between 2,950 and 3,200 Angstrom units, will be called "B." When measured with the instrument above mentioned, "A" shows a certain deterioration of the uranyl oxalate solution, for example, equivalent to 150 milligrams per square decimeter per hour, and lamp "B" shows a similar deterioration of 150 milligrams per square decimeter per hour. Let it be assumed that identical samples of a material are exposed simultaneously to the effect of lamp "A" and lamp "B" for an equal length of time. The deterioration of the tensile strength is measured after such exposure. In the case of lamp "A" the deterioration is assumed to be equivalent to 75% of the original tensile strength of the material; while the deterioration shown by the same compound in lamp "B" is only 25%. According to the intensity measurement as made by the instrument, the two lamps should have shown approximately equivalent amounts of deterioration, but it so happened that the wave length light in lamp "B" was essentially outside of the range of sensitivity which would effect the deterioration of the particular rubber.

If the wave length light to which the rubber was sensitive is also found in sunlight, then one would expect to get fairly close correlation between sunlight deterioration and the deterioration caused by the ultra-violet light lamp. Of course this is an extreme case and has not been experienced in rubber testing using the flaming-arc light unit, but may be an explanation for the poor correlation which has been reported in certain instances of experiments made to correlate sunlight deterioration and ultra-violet light deterioration caused by certain types of the ultra-violet aging lamps. Inasmuch as this difficulty is inherent in the material itself and depends on the range of the ultra-violet aging lamp, this objection would present itself regardless of the type of equipment used to measure ultra-violet light intensity. A relatively *narrow* range of ultra-violet should be selected for this purpose.

Earlier experiments seem to indicate that it would be possible to select definitely a certain range of ultra-violet light between 2,950 and 3,350 Angstrom units which would be responsible for the major portion of rubber deterioration. As data began to accumulate, however, it became apparent that light of the same intensity and the same range affected different compounds to a different degree. While in some instances reasonably good correlation with deterioration obtained with actual sunlight was secured, in other cases deterioration was not of the same magnitude or even in the same order as the deterioration obtained with natural sunlight. Thus, for example, one of the synthetic rubbers was found to undergo a lesser decrease in tensile strength when subjected to accelerated ultra-violet light than the tensile strength deterioration when subjected to natural light. On the other hand the extent of cracking and crazing of the surface was in the reverse order. In other words, the problem of light aging is not only an important one, but is a very active one. Only by the whole-hearted cooperation of the manufacturers of the rubber industry and the consumers of rubber articles, both private and government agencies, can final solution of this problem be evolved.

The present national emergency makes it imperative to utilize every known means of getting more life and more service out of rubber and rubber-like materials. The in-


**Fig. 1. Diagram of Machlett Type of Dispensing Burette**

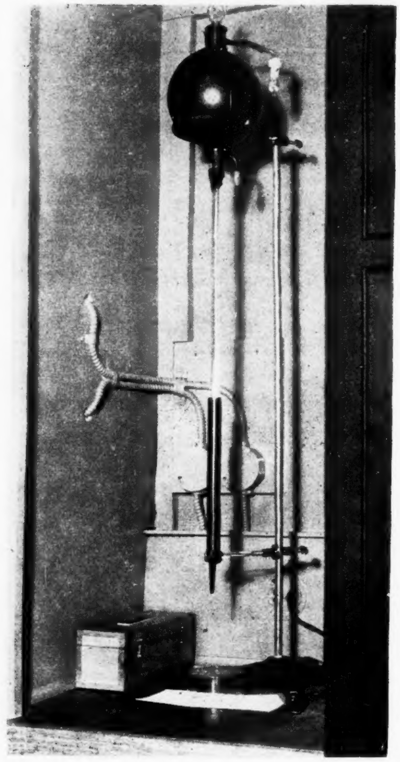


**Fig. 2. Dispensing Burette for Actinometer Solution**

clusion of a light aging test in all specifications for rubber articles which are used under conditions where they are subject to weathering and sunlight will, it is believed, serve to do this very thing.

If we can make a piece of hose last $2\frac{1}{2}$ years, where formerly it lasted only a year and a half, or year and three-quarters, we have saved that much rubber and are to that extent progressing in the conservation of strategic materials.

Let us cite a concrete example. Soft rubber gasket stock is extensively used as a gasket in airports, aboard commercial and naval vessels. When the airports are left open, this rubber gasket is exposed to the direct sunlight and to reflected sunlight from the water surface. Deterioration under these conditions is very rapid. In spite of the fact that the compound used in this type of gasket is a very high grade of medium soft rubber, experiments carried out within the last year indicate the life of this particular gasket material may be increased when properly protected by the inclusion of materials improving this sunlight resistance. Since thousands and thousands of pounds of this material are bought for this one purpose alone, it may be readily seen how effectively conservation of rubber and rubber-like materials may be carried out in this manner.

The selection of suitable equipment for the initial experimental purposes represents a problem. The apparatus in which accelerated aging was to be carried out must be of sufficient size so that a relatively large number of samples may be accommodated simultaneously. As the susceptibility curve of the various rubbers was not known, the apparatus was required to be sufficiently flexible so that both the intensity and the range of the ultra-violet

light could be shifted at will. The action must be automatic and require only a reasonable amount of attention on the part of personnel.

These several desirable properties were incorporated in a flaming-arc type of carbon lamp in which carbons of any desired *type or spectral distribution* could be burned and in which the samples could be exposed to the light either directly or after having been passed through suitable glass or Corex-D filters. Originally the tests were carried out using light filtered through Corex-D filter glass, but with the ever-increasing desire for speed in testing, it became apparent that some sacrifice might have to be made in the degree of correlation in the accelerated light aging and natural light aging in order to reduce the time of exposure. By proper selection of carbons in order to obtain a range of ultra-violet light similar to natural sunlight, it was found that apparently good correlation may be obtained in this "super-accelerated" aging test. Originally this test was intended as a rough approximation to be used only in research investigations. For specification purposes a test procedure was developed calling for exposure of longer duration to ultra-violet light filtered through Corex-D filter. Fortunately, however, the correlation with natural sunlight was sufficiently satisfactory to warrant now inclusion of this test procedure in hose cover stock specifications and other rubber materials which are exposed in normal service to weathering and sunlight. The cost of testing is decreased to between 10 to 20% of the long-time exposure test.

There is one objection to this "super-accelerated" test. That is that variation in the intensity in the light aging equipment is correspondingly magnified. In other words, in a 500-hour test approximately 60 sets of carbons would be used, and variations which cause intensity fluctuations would be balanced out. However, when the entire test occupies only 50 hours, relatively slight variations in intensity of the equipment become magnified proportionately.

Earlier in the article we mentioned the desirability of having some means of keeping constant check on ultra-violet light intensity. This is particularly important where

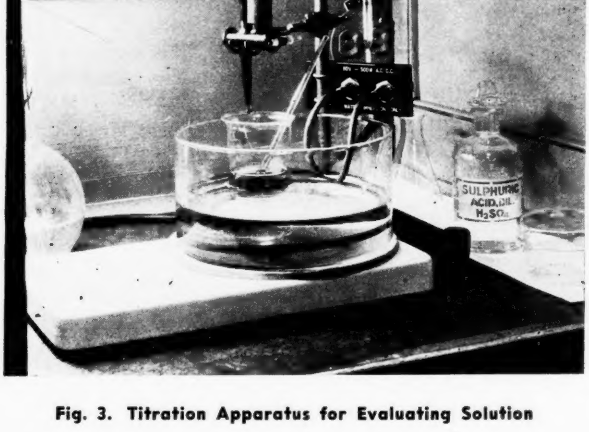



**Fig. 3. Titration Apparatus for Evaluating Solution**

it is desired to check the equipment of one laboratory with that of another, or where it is essential to conduct umpire tests. If the question of cost of equipment did not enter into the picture, perhaps the simplest method would be the use of a Taylor recording photo-electrometer. Its cost used to be approximately $3,000, but it is the writers' understanding that the cost of this material has increased in recent months. Rentchler, Brackett and Kuper have developed an ingenious photo-electric integrating meter for ultra-violet radiation. Investigation of this type of equipment indicated that this apparatus was designed to cover a range of from 2,950 to 3,200 Angstrom units. By using a Thorium photo-cell, the sensitivity range can be modified to cover a range of 2,700 to 3,600 Angstrom units. The maximum counting speed is one "click" per second. This is fast enough for natural sunlight aging as summer sun gives only about one count or click every three seconds. For strong ultra-violet light lamps it would not work fast enough unless the instrument were used at a greater distance than the distance between light and the specimens aged.

In the bibliography appended to the concluding installment, references are given to a number of other methods which were investigated. However largely on the recommendation of Dr. W. W. Coblentz, of the National Bureau of Standards, the uranyl oxalate method was decided upon as most nearly meeting the following requirements:

(a) The apparatus should accurately determine intensity of ultra-violet light over the range generally found in sunlight and preferably below 2,750 Angstrom units.

(b) The apparatus should not require standardization except at rare intervals.

(c) The equipment should be simple enough for any technically trained operator not especially versed in this subject to take readings.

(d) The apparatus for the equipment should be sufficiently inexpensive so that all laboratories using ultra-violet light accelerated aging tests may avail themselves of this method to check intensity.

(e) It is desirable that the apparatus be capable of measurements over a relatively extended period of time in order that cumulative effect of light exposure may be determined.

(f) The time required for making determinations should be as short as possible.

This uranyl oxalate actinometer method, which is briefly described in Federal Specification ZZ-R-601a, is carried out as follows:

The actinometer solution consists of a 0.050 molal concentration of oxalic acid ($H_2C_2O_4 \cdot 2H_2O$), i.e., 6.30 grams per liter and a 0.0100 molal concentration of uranyl sulphate ($UO_2SO_4 \cdot 3H_2O$), i.e., 4.20 grams per liter. The evaluating solution is a 0.100 normal (oxidation equivalent) potassium permanganate ($KMnO_4$) solution containing 3.16 grams per liter.

The above solutions may be prepared in ordinary diffuse light, but should be stored in the dark immediately after preparation and should be kept in the dark until used. The solution of potassium permanganate, prior to use, should be allowed to stand for one week and then filtered through a 1/8-inch thickness of fibrous glass filter cloth. The automatic dispensing burette, shown in Figure 1 and 2, is suitable for storing and dispensing the solutions when the reservoir and connecting tubes have been heavily coated with black enamel to exclude light.

The actinometer solutions are titrated against the evaluating solution when fresh lots of either solution are prepared or when either solution has stood for more than 60 days. The titration should be made by taking an ac-

curately measured 45- to 50-milliliter portion of the actinometer solution in a 200 milliliter tall form beaker, diluting it with 20 to 25 milliliters of distilled water, acidifying with 5 milliliters of dilute (1 to 3) sulphuric acid, and heating to approximately 95° C. in a light-proof water bath. The beaker containing the solution, upon reaching 95° C., should then be immediately transferred to an open glass water bath, also heated to 95° C. and resting on a flat white glass base. (See Figure 3.) The evaluating solution should be added, with stirring, until an orange color is obtained which persists for at least 30 seconds. The titration should be conducted in such a way that the volumes of solutions used are precise to within plus or minus 0.05-milliliter. The evaluating solution (potassium permanganate) should be standardized against sodium oxalate in the usual way, with such precautions that its strength is known with an accuracy of at least plus or minus $\frac{1}{10}$%. This strength is expressed in terms of the number of milligrams of anhydrous oxalic acid to which one milliliter of the solution is equivalent.

The intensity of radiation is measured in terms of the milligrams of oxalic acid decomposed per square decimeter per minute, and the quantity of radiation in any given time is measured in terms of the milligrams of oxalic acid decomposed per square decimeter. The actinometer cell is filled with a precisely measured quantity of the uranyl oxylate solution, placed in the holder and exposed to the radiation of the ultra-violet light unit or natural sunlight under the same conditions as the specimens under test. The distance from light source to actinometer cell should be adjusted as closely as possible to be the same as that between light source and the surface of the test sample because the intensity of the radiation varies as the square of the distance.

The cell is protected from light except during the actual exposure period. After exposure the solution from the cell should be titrated against the evaluating solution by the procedure outlined above for standardization; the quantity of the evaluating solution required is designated as $V_1$. A similar titration is made on a volume of actinometer solution equal within plus or minus 0.05-milliliter to that which was exposed in the cell; the quantity of the evaluating solution required is designated as $V_2$. The quantity of oxalic acid, in milligrams, decomposed by the radiation to which the cell was subjected is given by the relation,

$$Q = a(V_2 - V_1)$$

where $a$ is the number of milligrams of oxalic acid equivalent to 1 milliliter of the evaluating solution. $V_1$ should be not more than 90% nor less than 70% of $V_2$; or in other words, the decomposition should be between 10 and 30%.

The quantity or dosage of radiation is expressed as $\frac{Q}{A}$, and the intensity of radiation as $\frac{Q}{At}$ where $A$ is the area of the cell, in square decimeters, and $t$ the time of exposure in minutes.

The material for test is in the form of strips molded or buffed to a uniform thickness of not less than 0.07- or more than 0.08-inch. These strips are usually stretched to an elongation of 20% (except as will be noted) by means of a suitable frame and mounted so as to receive the radiation from the ultra-violet light source. The temperature of the air in the vicinity of the specimens being irradiated should be kept at 50° plus or minus 5° C. by controlling the temperature of the room and the ventilation of the space surrounding the specimens. The dosage of radiation varies with different types of rubbers or synthetic rubber, but is measured by means of the actinometer solution and cell described above. With new materials measurement of radiation is made at the beginning and the end of each run and at intervals of not more than 24 hours during the run. Immediately at the end of the exposure period the strips are examined by means of a binocular microscope for cracking and checking. They are released and allowed to stand for at least 16 hours, after which dumbbell specimens are prepared and measurements made of tensile strength and ultimate elongation. Similar measurements should be made on specimens which were not exposed to the radiation in order to determine change of tensile strength and per cent. elongation.

*(To be concluded)*

## Extender for Rubber Cement

Extenderex, an aqueous compound which can be mixed with naphtha rubber cements, reportedly permits the extension of a rubber film by maintaining the initial viscosity of the cement. Suggested applications include use with cements for combining and coating operations where, it is claimed, Extenderex will not impair the bond between rubber and cloth and may offer manufacturers an opportunity of conserving their limited supplies of crude rubber. In coating work, Extenderex-compounded cements may be used as a back coat or as a possible first or second coat, over which a coat of ordinary rubber cement may be applied. In combining processes the addition of Extenderex to the cement is said to increase adhesion and impart a firm handle to the cloth. It is added that a softer handle may be produced by plasticizing Extenderex with Extenderex plasticizer. As the new material retards the drying time of the rubber cement, it is recommended that machines with a high drying capacity be used. For both combining and coating, two volumes of rubber cement are mixed with one volume of Extenderex, which is produced by the Malrex Chemical Co.

## Printing on Fabrics Containing Rubber

Ahcoprint bases are light-yellow liquids used in the preparation of printing pastes which may be applied to rubber-containing fabrics, such as garters and other goods made with Lastex threads, and which will not harm rubber parts of printing machines used in the textile industry, according to tests by the manufacturer, Arnold, Hoffman & Co., Inc. The printing pastes are made by adding cold water, of sufficient quantity to yield any desired consistency, and pigment pastes of the water type to the Ahcoprint base, and stirring until a homogeneous mixture is obtained. Printing pastes based on Ahcoprint reportedly produce sharp prints which are resistant to soap or alkaline washes and do not stiffen on drying.

Two types of base are manufactured, Ahcoprint F and Ahcoprint G. The latter, which is cheaper, contains some naphthas; while Ahcoprint F contains pine oil as the only solvent. It is claimed that the pastes will not putrefy or sour in storage and that the formation of a skin retards any tendency of the paste to dry out. Ahcoprint reportedly contains no grit and is non-inflammable. Ahcoprint F has a density of 8.11 pounds per gallon, and Ahcoprint G has a density of 7.2 pounds per gallon.

# The Development of the German "Ersatz" for Carbon Black

**Hugo Fuchs**

WHILE popular interest has been focussed on German "ersatz" materials for rubber and cotton, scant attention has been paid to the fact that German industry has been independent of American carbon black shipments since the beginning of the present war. Germany apparently began preparing for this self-sufficiency before 1922 since the first German reports concerning attempts to manufacture blacks similar in quality to the American blacks appeared in that year. Numerous applications for German patents were made, and some practical as well as theoretical successes were realized.

Germany, however, remained one of the best customers of American carbon black until the outbreak of war, as Table 1 indicates. These statistics also reveal the interesting fact that Germany accumulated stocks of carbon black in 1937, 1938, and 1939 (until September). Great Britain, however, did not accelerate her purchases until after the actual start of the war.

It is believed that German carbon black requirements amounted to approximately 16,000,000 pounds a year. Thus the German import figures would indicate that Germany had a little more than a year's supply at the start of the war. But even though these reserves were augmented by supplies of American carbon black captured by the Nazis in Czechoslovakia, France, and other occupied countries it is probable that they have been consumed by now and that Europe today depends on gas blacks produced from solid and liquid hydrocarbons in Germany and probably in Czechoslovakia and Poland.

The German lampblack industry dominated the world until 1914 when both British and American chemists[1] observed the reenforcing effect of carbon black on rubber compounds—a discovery which induced rapid development of the American gas black industry and equally rapid decline of the German industry, as German lamp black would not reenforce rubber. German industry then had two cogent reasons for developing home-made carbon black: (1) to regain the top position in world trade, and (2) to become self-sufficient and be independent in case of war.

Thus the present manufacture of German "ersatz" black is not improvised, but is the definite result of a long and continued program of development. By 1937 the German product was able to compete with American carbon black in quality and probably in selling price, too. Before 1922 Germany tried to devise an "ersatz" black by improving the old non-reenforcing lamp black. The *Gummi-Zeitung*[2] reported the results of tests on rubber compounds filled partly with American carbon black and partly with lamp black produced by Aug. Wegelin, A.G., Kahl, a.M. While this report was very favorable for the German firm, it was soon found that the results could not be duplicated in commercial work. An impartial account of later experiments, comparing the influence of American carbon black and of lamp black on rubber compounds,[3] concluded that German lamp blacks were unable to substitute for American carbon blacks.

Experiments then turned in a new direction, and the Dynamit Nobel Corp., Bratislava, Czechoslovakia, which owned gas wells in Rumania, tried vainly to produce a real carbon black from natural gas by using American processes. These experiments never progressed beyond the laboratory stage because of the unsatisfactory results obtained; the material did not have the same deep black color as that of the American product, and the reenforcing activity of the new carbon black did not satisfy the rubber factories which were entrusted with the tests.

The German chemical industry next began to take possession of the problem. As early as 1881, Berthelot had found that acetylene can be disintegrated by explosion into a very fine dispersed carbon and hydrogen gas, and the newer German methods followed this direction. German carbon black is now manufactured from unsaturated hydrocarbons such as olefins (ethylene, etc.), diolefins (butadiene, etc.), acetylene and its homologs, anthracene, naphthalene, and gaseous unsaturated hydrocarbons.

From 1926 to 1930, I. G. Farbenindustrie, A.G., Frankfurt a.M., applied for numerous German[4] and foreign patents referring to carbon black. In addition are patents[5] of subsidiaries or allied firms, such as the Gold- und Silberscheide Anstalt, A.G., Frankfurt a.M. Many of these patents refer to the manufacture of carbon blacks from hydrocarbons by thermal decomposition in the presence of catalysts.

Reviewing the modern production of carbon black, H. Hadert[6] testified "that the efforts of the German carbon black industry to produce a product equal in properties of the American imported material have now been crowned with success. The Wegelin works is now producing a black comparable in color depth with imported carbon black; whereas L. Mohr & Co., Hersfeld, is producing

[1] "The Use of Gas Blacks in Rubber Compounds." A. H. Smith, *India-Rubber J.*, Mar. 25, 1922, p. 23.
[2] "Uber Russ in Kautschuk-mischungen." E. Marckwald and F. Franke, Sept. 29, 1922, pp. 1459-62; Oct. 13, 1922, pp. 5-8.
[3] "Is There a Substitute for American Carbon Black?" W. B. Wiegand, *India Rubber J.*, Sept. 4, 1926, p. 17.
[4] German patents Nos. 481,736, July 14, 1926; 552,623, Jan. 1, 1928; 542,804, July 6, 1928; 566,709, Oct. 4, 1928; 565,556, Nov. 10, 1928; 540,864, June 4, 1929; 551,534, July 28, 1929; 523,627, Oct. 3, 1929; 549,348, July 5, 1930; and 603,742, Sept. 23, 1930.
[5] For example, German patent No. 667,119, Aug. 10, 1934.
[6] "Moderne Russherstellunge." *Deut. Chem. Ztg.*, May 4, 1932, pp. 349-51; and "German Carbon Black." *India-Rubber J.*, May 21, 1932, p. 1.

TABLE 1. EXPORT OF AMERICAN CARBON BLACK

| Consumers | 1936 | | 1937 | | 1938 | | 1939 | | 1940 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Lbs. | Value | Lbs. | Value | Lbs. | Value | Lbs. | Value | Lbs. | Value |
| Germany | 16,225,000 | $738,000 | 27,441,000 | $1,172,000 | 23,646,000 | $1,076,000 | 19,660,000 | $857,000 | * | * |
| United Kingdom | 46,956,000 | 2,163,000 | 48,381,000 | 2,467,000 | 44,429,000 | 2,104,000 | 66,214,000 | 2,975,000 | 77,308,000 | $3,503,000 |
| Canada | 14,131,000 | 634,000 | 17,171,000 | 719,000 | 13,867,000 | 372,000 | 17,933,000 | 486,000 | 19,622,000 | 592,000 |
| All countries | 154,718,000 | 7,250,000 | 184,252,000 | 8,700,000 | 167,968,000 | 7,579,000 | 203,827,000 | 8,888,000 | 177,617,000 | 7,823,000 |

Source: U. S. Bureau of Mines.
*Not available.

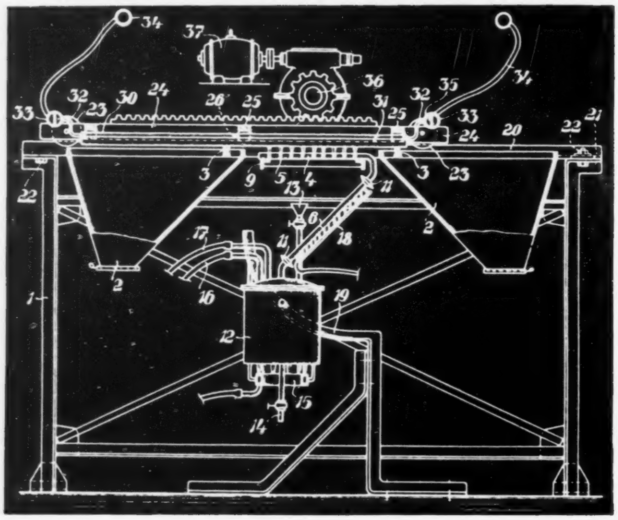



**Fig. 1. Drawing of Dusek Carbon Black Production Apparatus**

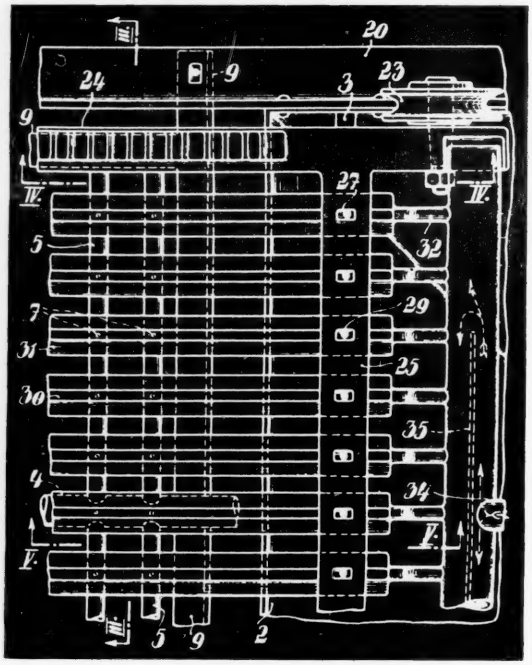



**Fig. 2. Detailed View of Grate**

a very fine particle pigment by a new process. This latter black is stated to be so fine that it bulks in the ratio of three to one against American gas black. As with most German carbon blacks, this new material is made by the combustion of either crude naphthalene or crude anthracene, and during the combustion the flame is subjected to the influence of an electric field with a high tension of 40,000 volts. The German industry, however, is finding it difficult to compete with the imported materials on a price basis."

This last sentence explains why the German factories, despite theoretical progress in this field, delayed large-scale carbon black production for such a long time.

Unexpectedly the problem was solved by Bata, owner of the well-known shoe factory, Th. Bata, Zlin, Czechoslovakia. This plant, the biggest of its kind in Europe, produced tires and other rubber goods on a large scale. Desiring independence of foreign sources, Bata produced, as much as possible, all the materials needed in his factories, spinning the cord for his tires, manufacturing accelerators and fillers in his own chemical plant, and operating his own rubber plantations.

In accordance with this policy of self-dependence, Bata built a pilot plant for carbon black, using the patents of a Czech inventor, Dusek[7], who describes his invention as follows: (See Figures 1 and 2.)

"The object of the invention is the continuous production of fine gas black. The machine is distinguished from the apparatus hitherto employed for the same purpose by its simplicity, its compact construction, and also by the uniformity and exact controllability of its working by which it is superior to the machines previously known not only in regard to the yield, the purity and the brilliant black color of the product, but also by its enabling gaseous as well as liquid and solid material to be treated, especially by-products of petroleum distillation, any other gaseous or liquid hydrocarbons, and particularly naphthalene and its related compounds.

"A machine fitted with 1,000 flames of 0.5-millimeter diameter can treat at least four kilograms of commercial raw naphthalene per hour of continuous work, and produce two kilograms of finest carbon black having hardly any determinable traces of ash and acetone extract. It therefore exceeds the arrangements previously known as regards the quantity and also the quality of the product, in spite of the fact that it entails disproportionately smaller initial and working costs, and a much easier and cleaner working is possible."

The first and principal claim is formulated as follows: "A machine for the continuous production of carbon black by the combustion of carbonaceous raw material, and collecting the carbon on movable cooled surfaces, having a container (12) for the carbonaceous gases and vapors to be treated, into which controllable pipes (16, 17) for blowing in combustible (preferably a gas rich in carbon) or non-combustible gases (such as air), or both, open and from which the gases and vapors are fed under controllable excess pressure to parallel rows of holes of a multi-flame flat burner (4) which is arranged below a grate shaped cooler that consists of parallel tubes (31) traversed by a cooling medium and running above the rows of holes (7), the grate being approximately double the length of the row of holes and being moved to and fro in the direction of the same with controllable pauses, during which it remains stationary alternately with one of the two halves above the burner."

Bata tried selling the newly manufactured carbon black in 1935 to other tire manufacturers as well as using it for his own purposes, but he was not very successful as the quality of his product was unsatisfactory, not equalling the American product in color or in the reenforcing effect.

Another Czech factory, however, the Rütgers Co., Morovska Ostrava, which manufactured coal-tar products, was better for this special task. This company, which was connected with the mighty Witkowitzer Iron Works, bought the Dusek patents in 1936 and began large-scale manufacture of carbon black from naphthalene and later from anthracene. The new carbon blacks were comparable with American blacks, according to preliminary tests by leading tire manufacturers in Czechoslovakia, Germany, and Austria; and, as the price was about 15% below the American price, manufacturers in these three countries began buying the locally-made black in larger quantities. Rütgers, which had close German connections, had plans

[7] British patent No. 434,393, filed Jan. 15, 1935.

for a new factory near Berlin, and a Polish factory at Kattawitz had been fully completed when Czechoslovakia was seized.

Since no American carbon black has reached Germany since the war began, Germany has been producing her own black for the rubber and other industries. The main manufacturers are the Bayerische Stickstoffwerke, A.G., Berlin, the Gold- and Silberscheide Anstalt, and Gottfried Wegelin, Zons a.Rh.

As in 1922 and in 1932, figures comparing the properties of American and German carbon blacks have been published this year.[8] There are no differences in the particle size and its maximum and minimum values, and no differences in tensile strength and elongation imparted to a rubber compound.

One question which cannot be answered until the termination of the war is that concerning the ability of the German industry to compete with the American industry. The lower prices of the Rütgers Co. before the war may be misleading, and little is known about the production costs of American and German carbon blacks. But German technologists are of the opinion that carbon black from coal-tar products cannot be produced so cheaply as carbon black from natural gas. England, however, does not anticipate the displacement of American carbon black by "ersatz" black manufactured from hydrocarbons, according to a review published recently by the *India Rubber Journal.*[9] This article expressly points out that American gas black is a material which the rubber industry could not replace by a substitute in case of emergency.

The history of Germany's "ersatz" carbon black industry has been related here at length for one reason. There are very few industries in which the United States boasts a world monopoly. Carbon black is one. Beyond every doubt Germany will try in the future to destroy this monopoly.

[8] "Carbon Black Investigations with the Super-Microscope." H. Heering, I. N. Gizycki, and A. Kirseck, *Kautschuk*, May 4, 1941, pp. 55-62.
[9] "Rubber Compounding in Wartime." July 26, 1941, p. 3.

## Cellular Rubber

Cellular rubber, consisting of a thin external dense layer enclosing microscopic cells of nitrogen gas in a matrix of rubber, each cell being separate from the others, has a thermal conductivity value (insulation or *K* value) of 0.237 B.T.U. per hour per degree Fahrenheit temperature difference for a specimen one foot square and one inch thick. This value reportedly is lower than any of the 37 values listed in the United States Department of Agriculture Handbook dated November 2, 1939, and is lower than any of the values listed in the current edition of "Handbook of Chemistry and Physics." More than twice as light as cork, cellular rubber insulation board is to be manufactured by the United States Rubber Co. in two weights: 4.5 pounds per cubic foot, and 5.5 pounds per cubic foot for one-inch thick material. Only the lighter of these two weights is claimed to be fire resistant. The 4.5 weight is said to withstand 22 pounds per square inch without crushing, and the 5.5 weight, 35 pounds. Because it is water-resistant, cellular rubber is now being used in life jackets; it is said to be ten times more resistant to water than cork or balsa wood. In addition, cellular rubber is reported to be rot-proof, acid resistant, resistant to vermin and termites, and a material of long life. It is said to be workable and may be cut to shape with a bandsaw or powersaw, or even whittled with a knife. A planer may do any necessary surfacing, and, as it is thermoplastic, cellular rubber may be shaped by heating and bending while hot. Cellular rubber is used for heat insulation under the decks of mosquito-type torpedo boats, in supports for self-sealing gas tanks in airplanes, in the food container equipment of a commercial airline, and on the world's first all-metal yacht now under construction at New Bedford, Mass.

## Flextite Artificial Latex

An artificial latex, Flextite R-82, now in use for over five years, is a compounded dispersion of natural rubber containing relatively coarse filler particles and fine rubber particles and having a solids content of about 48.5%. Made by the Flextite Corp., it is a white liquid of medium low viscosity having an ammoniacal odor and a pH of about 9.9. The whitish, opaque, elastic films which the material forms are weaker than latex films. Flextite R-82 is vulcanizable with sulphur or any of the standard vulcanizing agents, and, with certain controllable differences, latex compounding practices may be applied. Although in a form suitable for most of its applications, Flextite R-82 may be further compounded for other uses, and it may be compounded with latex or rubber dispersions. It is recommended that Flextite R-82 be applied by spraying, rather than by dipping, as it is too viscous to permit an even coat when dipped. Suggested uses for Flextite R-82 include: protective coating for new automobile parts in transit; compounding with casein for general adhesive practices; impregnating or coating paper and fabrics; compounding with paper pulp for producing rubberized paper; road marker paint; possible binder for water-soluble casein paints; acid-proof tank linings; builder and whitener for reclaim rubber dispersions; and, since Flextite R-82 may be further compounded either to improve or alleviate tack, it may be used for non-skid rugs or rug anchors or as a tack alleviator and filler for certain hydrocarbons, such as asphalt.

## N-Series Neoprene Base Cements

Self-vulcanizing at room temperatures N-Series neoprene base cements, manufactured by Union Bay State Co., Cambridge, Mass., are said to form strong, tough, non-thermoplastic films having age- and oil-resisting properties similar to those of the parent material, neoprene. Relatively non-toxic, these cements are claimed to contain no benzol or chlorinated solvents.

Applicable as one-coat cements of the pressure sensitive type, N-Series cements reportedly deposit tacky, quick drying film which remain in temper from 15 minutes to three hours after application, the strength of the bond increasing as the film vulcanizes. The cements are said to be satisfactory for bonding natural rubber to natural rubber, neoprene to neoprene, "Thiokol" to "Thiokol", or any of these materials to each other or to metals, leather, fabrics, wood, etc. Among many other applications, use is found for the cements in coating fabrics and for impregnating cotton belting to impart oil-resistant properties. N-series cements reportedly exceed the Army Air Corps specification #26571 for such uses as barrage balloons, self-sealing fuel tanks, etc.

# The Economics of the Use of Neoprene Reclaim[1]

**Donald F. Fraser[2]**

EVERY rubber chemist or compounder is, by nature of his profession, an economist. One of his most important duties, if not the most important, is to produce at the lowest possible cost articles which will have adequate and satisfactory performances in service. With "synthetic rubbers", which cost three or four times as much as natural rubber, extra efforts must be made to keep the compound cost at a minimum. The inescapable cost of mold scrap and the inexcusable cost of scorched or set-up stocks resulting from improper or careless processing or scheduling must be considered as parts of the overall compound cost. Unless care is exercised to avoid scorched stocks, the overall factory cost of an article may be increased considerably over the estimated cost, thus vitiating an otherwise successful development, promotion, and sales campaign. While the ability of a compounder may be judged by the size of the scrap pile, the cost penalty of scorched stocks may be partially decreased by salvaging or reclaiming these unfortunate errors. It is the purpose of this paper to discuss ways and means of salvaging scorched stock with particular reference to vulcanized and partially vulcanized neoprene stocks.

## Cost Reduction Methods

With the current increase in production and shortage of synthetic elastomers the reclamation of scrap is of pertinent interest as a conservation as well as an economical measure. In England, where there is no domestic source of elastomers, the situation has become so critical that recently the Ministry of Aircraft Production has approved the use of up to 25% of reclaimed neoprene in neoprene stocks.[3] Fortunately the situation in this country has not reached, and possibly may not reach, such a stage, but cognizance should be taken of the familiar adage—"To be forewarned is to be forearmed."

It is obvious that the cost of a neoprene compound may be reduced by:

(1) Diluting or extending the neoprene with natural rubber or rubber reclaim.
(2) Diluting the neoprene with fillers and/or softeners.
(3) Diluting or extending the neoprene with ground neoprene scrap or neoprene reclaim.

The first method is of questionable overall economy because those physical properties of the product which demand the use of neoprene suffer in direct ratio with the amount of rubber or rubber reclaim used. In addition commonly used rubber accelerators, necessary for vulcanizing the rubber hydrocarbon phase of the mixture, frequently function as powerful accelerators for neoprene, which results in set-up or scorching of the unstable mixed stock. The obvious solution to this problem is to blend the neoprene and rubber stocks immediately before final processing or curing, but such a procedure results in extra handling and consequent extra cost which may defeat the economy of adding the rubber or rubber reclaim to the neoprene.

The use of additional fillers and softeners is the practice usually adopted in reducing the cost of a compound. The use of additional amounts of softeners allows the use of more filler to maintain a given cured hardness. These additions alter the physical properties of the vulcanizate so that ultimately a compromise must be made between desired physical properties and compound cost.

The third method is one which is now coming into prominence. The reclamation of cured scrap is of almost as great importance economically as the reduction of cured scrap. Heretofore the quantity of neoprene scrap accumulated by an individual manufacturer has been of such a small volume as to render a special handling of it uneconomical. With more and more neoprene being used it is desirable both from an economic and conservation viewpoint to devise a method of re-using neoprene scrap.

## Re-Use of Neoprene Scrap

One far-sighted reclaim manufacturer has initiated a long range research program with a view of determining methods of reclaiming neoprene and other synthetic elastomers. While it does not seem possible to "devulcanize" and reclaim neoprene by the same means and in the same sense as rubber is reclaimed, neoprene may be re-used by one of the following methods.

(a) Bin cured or set-up stocks may be replasticized to a usable plasticity by the use of softeners (tricresyl phosphate or other esters) and/or chemical plasticizers (Latac or Accelerator 552). The use of chemical plasticizers is applicable only to Neoprene Types G and GN and is very efficient with these types of neoprene if the bin cure has not reached an advanced stage.

(b) Cured scrap or set-up stock may be ground on a tight mill and added to the compound as "ground springs." This method has been adopted almost universally with varying degrees of success as a means of disposing of an otherwise embarrassing scrap situation. As may be readily realized, such ground scrap should be screened before use and should be added only to those compounds in which quality is subordinated to cost.

(c) Cured scrap may be converted into a pseudo-reclaim by grinding on refiner mills and adding physical softeners so that a thin sheet may be plied up on the refining roll. Depending on the composition of the scrap and the reclaimer's particular process, this method produces a reclaim similar in appearance to rubber reclaims. At the present time most of the reclaim manufacturers are prepared to custom reclaim neoprene scrap. In essence this method is similar to the first method except that fully cured scrap (mold scrap) may be used because of the better grinding action of refining mills as compared with conventional rubber mills.

A method of mill reclaiming neoprene scrap which has been used with some success is:[4]

"The scorched material is broken down on a conventional rubber mill or refining mill. To the shredded material is added, in small increments, approximately 5% by weight on the neoprene of a 'wetting agent' (mixed sodium salts of sulphated cetyl and oleyl alcohols). Each

[1] Presented before the New York Group, Division of Rubber Chemistry, A. C. S., Oct. 17, 1941, as winner of the first prize in the 1941 Essay Contest sponsored by the New York Group.
[2] Organic Chemicals Dept., Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

[3] Imperial Chemicals Industries, Ltd., Report N-19 (Jan., 1941).

[4] Imperial Chemicals Industries, Ltd., Report N-4 (Mar., 1939); R. B. F. F. Clarke, *Trans. Inst. Rubber Ind.*, 16, 51 (1940).

increment is thoroughly incor[illegible] before the next addition is made. This is continued [illegible] a smooth unbroken sheet is obtained. The additi[illegible] of 1-5% of process oil, tricresyl phosphate, or raw [illegible]eoprene aids in the reclaiming. The addition of 1% naphthalene to the reclaim after it has aged overnight assists in subsequent processing."

The remainder of this paper will be devoted to a discussion of the economies of using so-called neoprene "reclaim" as prepared on refining mills by reclaimers.

## Analyses and Properties of Reclaims

Since neoprene reclaims are produced on a custom basis, considerable variation is to be expected in samples obtained from various sources because there are no standard types of neoprene reclaim in the same sense that there are standard types of rubber reclaim.

A quantity of neoprene tire tread scrap (trimmings and mold flash) of the following composition was accumulated.

| | |
|---|---|
| Neoprene Type GN | 100. |
| Latac | .25 |
| Stearic Acid | 1. |
| Neozone D | 1. |
| Extra-Light Calcined Magnesia | 4. |
| Channel Black | 31. |
| Circo Light Process Oil | 1. |
| Zinc Oxide | 5. |

The tread scrap was custom reclaimed by a prominent reclaim manufacturer and is identified as Reclaim E. At the same time samples of neoprene reclaim were solicited from four other reclaim manufacturers. These are identified as Reclaims A, B, C, and D in Table 1, which shows the analysis and the mill behavior of each reclaim.

TABLE 1. ANALYSIS OF NEOPRENE RECLAIMS

| Reclaim | % Chlorine | % Sulphur | % Acetone Extract | % Ash | Specific Gravity | % Neoprene |
|---|---|---|---|---|---|---|
| A | 13.88 | 0.50 | 10.94 | 16.37 | 1.476 | 37.9 |
| B | 14.06 | 3.05 | 15.29 | 25.08 | 1.481 | 38.0 |
| C | 9.83 | 1.29 | 22.92 | 9.23 | 1.386 | 26.6 |
| D | 10.19 | 2.33 | 26.02 | 9.82 | 1.395 | 27.5 |
| E | 19.00 | 0.96 | 25.73 | 5.04 | 1.306 | 51.4 |
| Tread Stock | 25.60 | 1.28 | 5.59 | 4.57 | 1.392 | 69.3 |

Appearance on the Mill

Reclaim

A—Sample ran slightly rough on mill—neutral odor.
B—Sample too rough and short to form band on mill. Pronounced odor of factice and/or dibenzyl ether.
C—Sample ran satisfactorily on mill—similar to inner tube rubber reclaim. Odor of cumarone and/or rubber reclaim.
D—Sample ran slightly rough on mill. Pronounced odor of naphthenic acids or naphthenates.
E—Sample ran satisfactorily on mill—neutral odor.

The chlorine determinations were made by the Parr bomb method[5] and are a necessary part of a neoprene reclaim analysis in order to assay the neoprene content of the reclaim. Commercial neoprene contains, on the average, 37% chlorine. This factor was used in calculating the neoprene content of the reclaims shown in Table 1.

Speculation on the probable composition of the reclaim or the compound from which the reclaim was made is rendered easier by reconstructing the previous table so that the analysis appears as based on 100 parts (by weight) of neoprene. This has been done in Table 2.

TABLE 2. ANALYSIS OF RECLAIMS BASED ON 100 PARTS (BY WEIGHT) OF NEOPRENE

| Reclaim | % Sulphur | % Acetone Extract | % Ash | Total Parts by Weight Less 100 Parts Neoprene |
|---|---|---|---|---|
| A | 1.3 | 28.9 | 43.1 | 164 |
| B | 8.0 | 40.1 | 66.0 | 163 |
| C | 4.9 | 86.1 | 34.7 | 276 |
| D | 8.5 | 94.7 | 35.7 | 264 |
| E | 1.8 | 50.1 | 9.8 | 95 |
| Tread Stock | 1.8 | 8.1 | 6.6 | 44 |

[5] S. W. Parr, *J. Am. Chem. Soc.*, 30, 764 (1908).

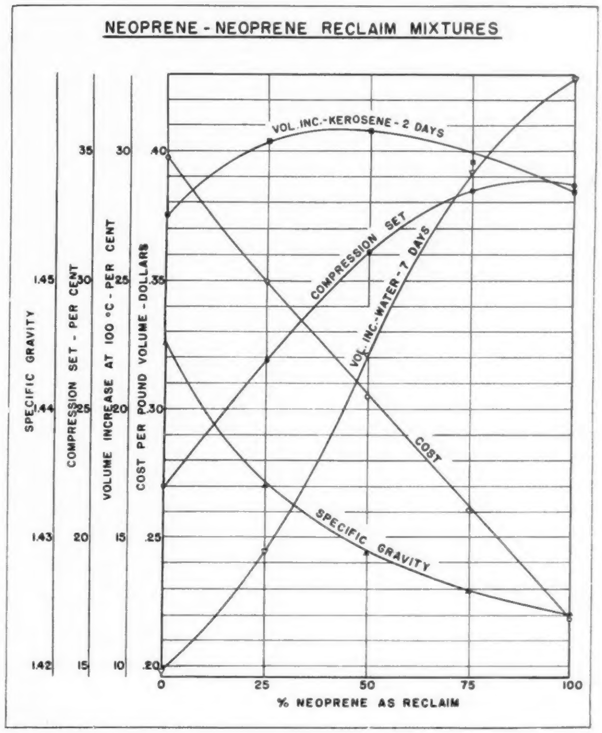



**Fig. 1**

The analyses indicate that, because of the high ash figures, Reclaims A to D contain substantial amounts of whiting, clay, or barytes. Reclaims B, C, and D probably contain factice as indicated by the high sulphur content and large amount of acetone extractable material as well as by the low hardness (Table 3).

In addition to varying in composition the reclaims varied in physical properties. In Table 3 are shown the stress-strain results obtained on slabs press cured 40 minutes at 307° F. Also shown are the results after the reclaims were compounded with 10 parts of extra-light calcined magnesia and 10 parts of zinc oxide per 100 parts by weight of reclaim.

TABLE 3. STRESS-STRAIN RESULTS

(Press Cure—40 minutes at 307° F.)

| Reclaim | Stress at 300% Elongation | Tensile Strength, PSI | % Elongation at Break | Shore Hardness |
|---|---|---|---|---|
| | Uncompounded | | | |
| A | 425 | 425 | 300 | 65 |
| B | 200 | 500 | 530 | 31 |
| C | 200 | 325 | 500 | 40 |
| D | 250 | 350 | 460 | 43 |
| E | 175 | 500 | 400 | 38 |
| | Compounded with 10 MgO — 10 ZnO | | | |
| A | ... | 475 | 275 | 75 |
| B | 200 | 600 | 575 | 42 |
| C | 325 | 425 | 450 | 59 |
| D | 400 | 475 | 360 | 65 |
| E | 525 | 700 | 360 | 52 |

Compounding with magnesia and zinc oxide has but slight effect on the stress-strain results although the Shore hardness is considerably increased. This indicates that in neoprene-neoprene-reclaim mixtures no allowance should be made in the accelerator (metallic oxide) content for the neoprene hydrocarbon in the reclaim.

## Substituting Reclaimed Neoprene for Crude Neoprene

With this background a series of tests was conducted

to determine the effect on cost and physical properties of substituting neoprene reclaim for the crude neoprene in an arbitrarily chosen compound. For this work Reclaim E, made from the known tread stock scrap, was chosen. The data in Table 2 indicate that in reclaiming the cured tread stock the reclaimer added to the neoprene scrap 42 parts of acetone extractable material per 100 parts of neoprene. Allowing for some error in the analytical results, it was assumed that actually 50 parts of softener had been used.

A series of compounds was then mixed and tested. In this series the compounds were identical except that varying amounts of raw neoprene were replaced by an equivalent amount of neoprene as contained in the neoprene reclaim. The stock containing all crude neoprene was identical with the original tire tread compound except that 50 parts of a coal-tar derivative were added to compensate for the softener added to the reclaim during the refining operation. In addition the total carbon black content was increased, by the addition of soft carbon black, to 100 parts in order to obtain stiffer and more millable stocks. The same amount of carbon black was also added to the reclaim alone. The actual stocks tested and the cost figures of the stocks are shown in Table 4.

TABLE 4. NEOPRENE—NEOPRENE-RECLAIM MIXTURES

| Raw Neoprene: Reclaim Neoprene | 100:0 | 75:25 | 50:50 | 25:75 | 0:100 |
|---|---|---|---|---|---|
| Neoprene Type GN | 100. | 75. | 50. | 25. | .. |
| Reclaim E. | .. | 48.5 | 97. | 145.5 | 194. |
| Latac | .25 | .1875 | .125 | .06 | .. |
| Stearic Acid | 1. | .75 | .50 | .25 | .. |
| Neozone D | 1. | .75 | .50 | .25 | .. |
| Extra-Light Calcined Magnesia | 4. | 3. | 2. | 1. | .. |
| Channel Black | 31. | 23.25 | 15.5 | 7.75 | .. |
| Soft Carbon Black | 69. | 69. | 69. | 69. | 69. |
| Circo Light Process Oil | 1. | .75 | .5 | .25 | .. |
| Bardol B | 50. | 37.5 | 25. | 12.5 | .. |
| Zinc Oxide | 5. | 3.75 | 2.5 | 1.25 | .. |
| Cost/Lb. | $0.275 | $0.244 | $0.214 | $0.183 | $0.154 |
| Cost/Lb. Vol. | $0.397 | $0.350 | $0.305 | $0.261 | $0.219 |
| Specific Gravity | 1.445 | 1.434 | 1.429 | 1.426 | 1.424 |

In milling the compounds the neoprene was first plasticized with Latac and then blended with the reclaim before further compounding. In calculating the compound costs the market prices appearing in the August, 1941, issue of INDIA RUBBER WORLD were used. The price of the reclaim was assumed to be 20¢ per pound. The usual price of custom reclaiming is 10-15¢ per pound. To the higher figure was added 5¢ per pound to compensate for shipping and handling costs.

Using these compounds, several conventional tests were made. The results (on the 40-minute at 307° F. cure unless otherwise noted) are shown in Table 5.

The cost figures in Table 4 show that the cost of the particular compound used may be reduced 20-25% by replacing half of the raw neoprene with neoprene hydrocarbon in the form of reclaim. The compounds chosen may be used for medium- or low-grade mechanical goods such as grommets, dust seals, automotive bushings, etc., which are generally used in a static condition in service. Such compounds would be unsuited for high-grade mechanical goods subjected to severe flexing or abrasion.

In Table 5 the plasticity-recovery figures were determined on the Williams' parallel plate plastometer under a load of five kilograms. The plasticity number is the thickness in thousandths of an inch of a two-cubic centimeter pellet after three minutes at 80° C., the pellet being preheated for 15 minutes at 80° C. before testing. The recovery is the increase in thickness one minute after removal from the plastometer. The lower the figure, the softer and more plastic the stock. The plasticity figure of the 50:50 mixture indicates that it would be suitable for most factory operations including tubing. With ratios of reclaim higher than this, the stock would be too rough and nervy for easy processing.

TABLE 5. TEST RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Raw Neoprene | 100 | 75 | 50 | 25 | 0 |
| Reclaim Neoprene | 0 | 25 | 50 | 75 | 100 |
| *1. Plasticity-Recovery at 80° C. of Compounded Stock* | | | | | |
| | 61-1 | 106-4 | 200-51 | 320-99 | 333-125 |
| *2. Stress-Strain Results—Original* | | | | | |
| Cure at 307° F.—Mins. | 20 | 20 | 20 | 20 | 20 |
| Stress at 200% Elongation | 375 | 300 | 325 | 325 | 325 |
| Tensile Strength—PSI | 1100 | 1150 | 1250 | 1075 | 625 |
| % Elongation at Break | 495 | 490 | 500 | 460 | 290 |
| Shore Hardness | 55 | 54 | 51 | 51 | 53 |
| Cure at 307° F.—Mins. | 40 | 40 | 40 | 40 | 40 |
| Stress at 200% Elongation | 425 | 400 | 375 | 375 | 300 |
| Tensile Strength—PSI | 1100 | 1150 | 1250 | 1075 | 625 |
| % Elongation at Break | 420 | 420 | 440 | 430 | 290 |
| Shore Hardness | 55 | 54 | 53 | 53 | 53 |
| Cure at 307° F.—Mins. | 80 | 80 | 80 | 80 | 80 |
| Stress at 200% Elongation | 450 | 425 | 425 | 325 | 325 |
| Tensile Strength—PSI | 1125 | 1175 | 1325 | 1075 | 675 |
| % Elongation at Break | 400 | 410 | 460 | 420 | 300 |
| Shore Hardness | 56 | 54 | 54 | 53 | 53 |
| Aged 20 Hours at 260° F. — 80 #/In.² Air Pressure (Air Pressure Heat Test) | | | | | |
| Cure at 307° F.—Mins. | 40 | 40 | 40 | 40 | 40 |
| Stress at 200% Elongation | 1025 | 1175 | 750 | 600 | 450 |
| Tensile Strength—PSI | 1025 | 1175 | 1225 | 1175 | 1025 |
| % Elongation at Break | 100 | 100 | 200 | 200 | 220 |
| Shore Hardness | 90 | 86 | 82 | 78 | 74 |
| *3. % Resilience under 20% Compression* | | | | | |
| | 59.6 | 55.5 | 50.7 | 51.2 | 52.5 |
| *4. Compression set (30% Deflection)* | | | | | |
| | 22.0 | 26.9 | 31.1 | 33.5 | 33.5 |
| *5. % Volume Increase* | | | | | |
| Kerosene at 100° C. | | | | | |
| 2 Days | 27.5 | 30.4 | 30.8 | 29.6 | 27.6 |
| Water at 100° C. | | | | | |
| 7 Days | 9.8 | 14.5 | 22.1 | 29.2 | 32.9 |
| 14 Days | 21.4 | 30.1 | 42.1 | 42.5 | 47.3 |
| Process Oil at 82° F. | | | | | |
| 7 Days | 2.8 | 5.5 | 7.0 | 7.1 | 7.6 |

The presence of reclaim, up to 75%, does not adversely affect the original stress-strain properties or aging in the air pressure heat test. In fact, in the aging test, judged by the greater retention of elongation and less increase in hardness upon aging, the presence of reclaim is advantageous.

Resilience is reduced and the compression set is increased as the reclaim content increases. The compression set was determined according to A.S.T.M. Designation D-395-40T, Method B under 30% deflection except that pellets ¾-inch diameter by ½-inch were used.

The volume increase in kerosene is not greatly affected by the presence of reclaim, but the water absorption increases proportionately as the reclaim is increased.

For ease in comparison, some of these data are plotted in Figure 1.

## Summary

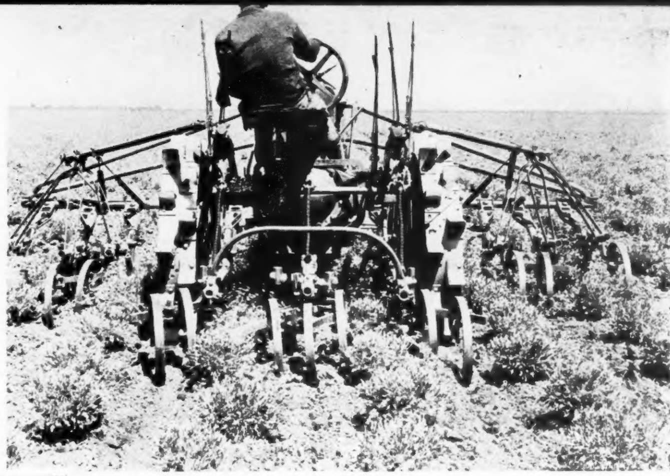
It is possible to reclaim mold and other vulcanized neoprene scrap by suitable reclaiming procedures. At the present time most of the reclaim manufacturers are prepared to do this reclaiming on a custom basis. The neoprene of the reclaim may replace as much as 50% of the raw neoprene in a compound to reduce by as much as 25% the volume cost without greatly impairing the physical properties of medium- or low-grade mechanical goods vulcanizates. Use of neoprene scrap in this manner will conserve the supply of neoprene, and under present conditions the value of such conservation is obvious. Besides this utilization of scrap will reduce the overall factory cost of many types of neoprene products.

While the volume of neoprene scrap available at the present time is small, the presence of larger amounts on the market, as a result of increased neoprene production, must be anticipated. Because of increased interest in neoprene reclaims due attention should be given to the problem of classifying and standardizing types of neoprene scrap and reclaim.

# The Cultivation of Guayule—II

**W. B. McCallum**[1]

Spence Plants Set out May 1, 1941, with Regular 36- by 24-Inch Spacing; Photographed August 9



Six-Row Cultivator in Operation during Plants' First Year

WITH the two main problems successfully controlled: that is, the production of plants and their satisfactory establishment in the field, the third and final problem was the development of a system to maintain a high percentage of rubber under at least reasonably rapid conditions of growth. It was already known from experience in Mexico that if the conditions for growth were very favorable, the plants would grow to a very large size, but the rubber content would almost disappear. Range plants five or six years old weigh a pound or less and contain 15 or 16% rubber; while similar plants under irrigation weigh six or eight pounds and yield 2 or 3% rubber. In the effort to overcome this difficulty, work along two different lines was carried on. Fraught with many discouragements, this work took a number of years, but finally yielded the desired results.

## Production of High Rubber Content

The first of these lines was an extensive study of the phenomenon of rubber formation in the plant and the factors that accelerated or retarded it. It was found that little rubber is formed in the plant during active growth, and very little for a long time afterward if the growth has been too luxuriant; but if the growth has not been forced too much or too long, and if other proper conditions are provided, the later formation of rubber is not seriously prejudiced. Plants grown rapidly for three years under irrigation may be left for a number of years without recuperating very much in rubber content. The reason is that the thick cortical tissue, which is the main rubber bearing area, is laid down only during periods of slow growth and only after the general increase in size for the season has been accomplished. Thus continuous growth prohibits the formation of the area in which rubber is naturally stored.

From studies on the formation of rubber under various experimental conditions, it was found that there was a certain seasonal rhythm between the functions of growth and the secretion of rubber, and that a moderate growth, if not too prolonged and if carried out at the right time, can be followed by a vigorous rubber formation. In other words if the plants are grown in the early part of the season fairly vigorously and then gradually dried before midsummer until no further growth can occur, they produce rubber in the latter part of the season very freely. Thus with alternating periods for growth and for rubber formation, each period coming at the proper time, it is possible to obtain the cumulative effect of both, and at the end of four years to have a field of adequate tonnage and have plants with a high percentage of rubber. In strictly arid regions the growth is secured by moderate irrigation in the early part of the season and its withdrawal early enough to throw the plant into dormancy about midsummer. In California the same result is obtained more economically by the use of the winter rains; the plants become dormant after the moisture from these rains is used up. In these regions the conditions fit rather admirably into the requirements of the plant. During the first year the plants are small, and their growth continues (using moisture from the winter rains) fairly vigorously, though not excessively, all summer. The next year, as the plants are larger, they absorb more moisture, and it is exhausted from the soil earlier. This process continues until the fourth or fifth year when the plants are quite large and virtually exhaust the soil moisture by the end of June, leaving the shrub in an ideal condition for producing rubber the rest of the year.

The other line of attack on the problem of obtaining more rubber in the shrub, while really easier to do, was much more spectacular. Early observations on the shrub showed a great deal of variation among the plants as they grew in their native condition on the range, and further work along this line revealed that the general range shrub is a mixture of many thousands of strains, varying enormously in general characteristics, size, capacity to reproduce, rubber content, etc. Under cultivation, that is, under conditions of good growth, these differences became much more conspicuous and appeared to offer an excellent opportunity for selection and breeding. It was soon determined that the small composite flowers are at least in the main self-fertilized by small insects, and that crossing among varieties is rare. The seed of considerably over a thousand different strains was gathered and sown, and the young plants were set out in rows in the field. As they grew, they showed enormous differences in all kinds of characteristics. In the main each variety was like the parent plant, but the differences between the different strains were remarkable in all sorts of ways. In size the smaller plants were less than one pound in weight, at five years, while the larger ones were 15 pounds; and they showed almost equally great variation in the percentage of rubber, but with one constant and lamentable difference. All the very large varieties were exceptionally low in rubber. It was quite obvious that most of these very large plants were the result of crosses between guayule and *Mariola*, a related plant which is fairly common in the guayule regions, but which contains only 1% to 2% of rubber.

[1] Chief botanist, Intercontinental Rubber Co., Salinas, Calif.

**Spence Field Planted with Different Varieties, Whose Range in Rubber Runs from 8 to 20% of the Dry Weight of the Plants**

**Arguello Field Comprising 100 Acres of Guayule, Planted in 1930 in Check Rows and Photographed August 9, 1941**

The work of selection and isolation among so many strains was slow and at first uncertain because the plants required at least four years' growth for full development. Initial results were disappointing because what was desired was a plant that combined the important characteristics of large size, high rubber content, ease of propagation, and adaptability to cultivation all in one; and at the start too much attention was given to the exceptionally large plants. None of these yielded so much rubber per plant as those of moderate size. In 1913 and 1914 there were set out some 2,000,000 shrubs grown from seed gathered off the range from the mixed Mexican plants, and in the succeeding years these plants were worked over in great detail; practically every plant was carefully examined, and thousands of analyses and selections were made. Seed of a large number of the more promising strains was picked, and the plants were grown and brought to maturity. Fifteen strains were finally selected as the most promising, seed was gathered, and the plants were set out in large acreages. But most of these under nursery and field conditions showed very serious weaknesses. Some were very sensitive to damping off and other nursery diseases; some rooted with difficulty and required better field conditions than reasonably could be supplied; and with one or two that grew well it was found that the mature plants contained an unduly large amount of resin. Ultimately the list was reduced to three plants. These are of good size, very strong growing, and resistant to nursery diseases; they give an excellent stand in the field and produce a high rubber content with, at the same time, a reasonably fast growth. These plants have been very materially improved because in nearly every year since they were first obtained, the seed of the better looking plants and those high in rubber content as shown by analysis at the end of the season were carefully collected. Seeds of plants best in rubber and also of other desirable characteristics were sown and, when large enough, set out in the field.

Under this procedure there has been a slow but continuous increase in the rubber content. That the rubber content can be very materially further increased there can be no question. As the plants remain in the fields and become older, the rubber content continues to increase so that in considering the amount of rubber in the plants, their age must be taken into consideration. In one field of essentially 600 acres the rubber content is now about 22% of the total dry weight of the plants. But this shrub is ten years old; yet at the age at which it is normally harvested, which is five years, the rubber ranged between 18 and 19%. The best strains are very constant in this respect and yield 20% rubber or a little better at the end of five years. At the end of six years the average of the varieties now in large acreages gives 2,160 pounds of rubber per acre, but in the same field at the same age the average of the three best varieties is 2,460 pounds of rubber per acre. This selection and improvement of strains is necessarily slow, but each year adds substantially to the amount of rubber that can be produced per acre.

## Problems of Guayule Growing in the United States

To present the question of growing guayule in the United States in a fair and logical way, mention must be made of the regions in which the plants will grow successfully, the soils for which they are best suited, the yields of rubber per acre that will be produced in different locations, and the cost involved per pound of rubber. Unfortunately in the past year or two the whole subject has been written up rather voluminously in the press by many people without much regard to actual conditions; consequently much misinformation has been published.

As already mentioned,[2] the work was started in 1912 and after several years in learning how to germinate the seed, produce good plants in the nursery, get a satisfactory stand of these when transplanted to the field, and a good deal about the different varieties, actual business operations were begun at Valley Center, Southern California, in 1913. There were planted 300 acres of the general varieties from the Mexican range and the task of working these over and selecting the better types was started. The soil at Valley Center was satisfactory, and climatic conditions were very good; and in the better varieties excellent yields of rubber were secured. But the amount of land for a large expansion was not available; so in 1916 the experimental work was moved to Continental in southern Arizona and continued there for six years during which several thousand acres were planted, all under irrigation. The plants grew well, but the rubber was slow in forming in the plants because of irrigation and also because the rains came in the summer and promoted plant growth just when the plants should be drying out. The net result was that while a large tonnage of shrub was obtained, it was impossible under the conditions followed to get a high enough percentage of rubber in the plants to justify the whole operation.

Further work there undoubtedly would have overcome most of the difficulties, but in the meantime there had been put out a series of small plantings of about an acre each in various parts of California that had given an indication of the growth of the plants and the formation of rubber in various locations. In California the rains come

[2] India Rubber World, Oct. 1, 1941, p. 34.

in the winter or early spring with none in the summer. The amount, of course, varies greatly in different places, but the principal rainfall is in December, January, February, and March, and from April to December it is virtually rainless. This was found particularly favorable for guayule, for it could be planted in the winter and early spring, and the winter moisture was sufficient to allow the plants, for the first year, with their rather low demand for water, to grow virtually the entire summer. In the next year the plants, being larger and requiring more water, used the water up faster and ceased growing about July or early August, and by the time they were four years old they used up the moisture and ceased active growth early in June and had the rest of the season to produce rubber.

By 1931 there had been set out about 8,000 acres of guayule in California, and the plants were growing well. A large factory for the extraction of the rubber had just started operations when the slump came and the price of rubber dropped to less than 3¢ a pound. Ultimately all of the shrub was milled, but extensive planting was discontinued except for purposes of improving both the quality and the yield of rubber and also for the continued object of determining means of running the whole operation at a very much lower cost per pound of rubber. These efforts have met with considerable success; the percentage of rubber in the shrub has been slowly, but continuously raised; the cost of nursery growing, planting in the field, and subsequent care of the plants has been greatly reduced. Contributing factors were improvements in machinery, the elimination of considerable work that was at first thought necessary, and the practice of more efficient methods throughout.

When considering the amount of land available in the United States on which guayule will grow well, it does not seem an impossible task, or even an essentially difficult one, to produce within our own borders 25% of our normal rubber needs. This would require, in general terms, 1,000,000 acres of land, 200,000 of which would be harvested and replanted each year.

To maintain, as has been suggested in Congress, 45,000 acres of guayule would require, if in one piece, an area a little less than 8.7 miles square. Of course, no area even of that size could be found with all the land suitable for cultivation. As a matter of fact, it would probably be in units of 10,000 to 12,000 acres each, which would be ample for the continuous maintenance of one factory. Assuming the land to be fairly similar to that now used at the California experiment station, on this 45,000 acres, one fifth, or 9,000 acres, would be harvested and replanted each year, yielding essentially 14,850,000 pounds of rubber annually.

However no estimate of the amount of land required to produce a given tonnage of shrub, or rubber, can even be approximated without knowing first the character of the land and the general climatic conditions, including particularly the amount and the period of the rainfall. In this respect guayule is no different from any other crop. At the experiment station in the Salinas Valley, on general upland soil, with no irrigation and a 14-inch annual rainfall, five-year-old plants yield 1,650 pounds of rubber per acre, and six-year-old plants, 2,160 pounds. These yields will be materially improved as the more recently selected varieties come into large acreages. Proceeding south the rainfall gradually decreases and with it the total growth of the shrub so that, although the percentage of rubber in the shrub is a little higher, the total amount of rubber per acre gradually decreases. On much of this land, however, a reasonable amount of water has been developed in recent years which, if applied at the proper times, will very substantially increase the growth of the shrub without affecting seriously the total rubber formation. It is not possible to express in arbitrary terms the requirements such as the amount of rainfall, temperature, etc., because these are so interlocked with other conditions that they may be very effective in one place and quite insufficient in another. At the present location

**Machine Which Picks 30 Bushels of Seed Daily without Injuring the Plants**

**Field Digger That Throws Two Rows of Plants into One, Which Later Are Gathered by the Harvester**

**Harvester Which Picks up, Chops, and Binds the Plants into Truck or Trailer**

near Salinas the summer temperatures are cool, and the air, which is mostly off the ocean, is quite damp, and even with 10 to 12 inches annual rainfall a satisfactory growth is obtained. But over in the interior valleys with the vastly higher temperatures and lower humidity, it requires a rainfall fully 50% higher to obtain the same result.

During a period of about ten years there have been established and maintained a series of 53 experimental stations of from one acre to five acres each, extending from southern Texas across to California and up the Coast region and the San Joaquin and Sacramento valleys to Red Bluff. These stations were all carefully looked after and were dispensed with only after the final results from each had been obtained. Thus in that entire stretch of country it is known fairly accurately just what guayule will do in the various regions. The greatest amount of available land is in southern Texas, but it will require some years' work to overcome the difficulties incident to the summer rains and the susceptibility to root rot in the soil.

Very substantial progress was made in both these lines, but the general depression in 1931 led to discontinuance of that work, and subsequent work has been of the nature above described. The same situation is true as to southern Arizona. In the coast country of California and in the interior valleys of that state the winter and spring rains with dry summers make conditions much more ideal, and there it has been thoroughly demonstrated what can be done.

# Rubber Survey[1]

A SHORTAGE of rubber imports from the Far East could be relieved by (1) increased production and imports from Latin America; (2) more efficient use of imported crude rubber; (3) increased reclaiming; and (4) increased domestic production of synthetic rubber and guayule.

But any emergency in the near future could not be met by increased Latin American production because seven years are needed to bring trees into bearing.

One of the best ways to conserve rubber is to retread more tires. At present about 4,000 retreading shops in the United States have an annual capacity of 10,000,000 tires. About 6,000,000 tires were retreaded in 1940, with 7,000,000 forecast for 1941. Tire manufacturers have concluded that about one-half of turned-in or discarded tires could be retreaded in new-tire molds. Assuming that 3,000,000 additional tires could be retreaded in established ships and that manufacturers could retread 30,000,000 tires in molds ordinarily used for new tires, 33,000,000 additional tires could be retreaded yearly. In retreading an average tire, which contained about 14 pounds of crude rubber when new, about 8½ pounds of camelback, containing about five of rubber, are used. Assuming that retreaded tires give a mileage 80% that of new tires, approximately 115,000 long tons of crude rubber might be saved yearly by retreading these 33,000,000 tires.

Reducing the number of varieties of reclaim and decreasing the degree of refinement would permit an annual production of about 340,000 long tons, or 20% more than present capacity levels. To build additional reclaiming facilities for 100,000 long tons per year would cost about 10 million dollars and require 18 to 24 months with the benefit of priorities. Natural rubber cannot be reclaimed repeatedly without marked deterioration in quality. Therefore this country could not rely on reclaimed rubber alone if imports of crude rubber were long cut off.

Present United States production of synthetic rubber is insignificant (4,000 long tons in 1940), although annual capacity may total about 20,000 long tons the end of 1941. The total cost of constructing plants, including those for supplying the required component materials, to produce 100,000 long tons of synthetic rubber annually would be from 75 to 100 million dollars. A single synthetic plant with a capacity of 20,000 long tons might be erected and equipped in 18 months, but because of the difficulty in obtaining steel and chemical equipment, it appears that from three to five years would be required to complete sufficient plants for our entire rubber requirements. The trade thinks that probably synthetic rubber could be produced in quantity at a cost of 25¢ per pound or less; the cost of producing butadiene rubber in Germany is about 40¢ per pound.

Tire companies, experimenting with butadiene rubber, have had much difficulty in using it. But they can make fairly good tires by mixing synthetic rubber in equal parts with natural rubber (*Hevea* or guayule). Some all-synthetic passenger tires are made in Germany, but the lack of sufficient adhesiveness is still presenting difficulties in making large tires with many plies.

Guayule is native to North Central Mexico and the Big Bend area of Texas. In 1912, the year of greatest output, Mexico produced 10,000 long tons of guayule rubber. After 1912 output declined and in 1940 amounted to about 4,000 long tons; facilities are being increased, and production in 1942 may amount to 7,000 long tons. Mexican production is from wild guayule, and the output is restricted in order to prevent extinction of the shrub.

Probably about 20 million dollars of capital investment would be necessary to produce 100,000 long tons of guayule annually. Starting with a cost of 80¢ a pound of rubber when the plant is harvested at one year, the cost decreases for every year until the plant is seven years old, after which the carrying charges exceed the increment in value. At four years, the cost is 15 to 19¢ per pound exclusive of interest on investment and cost of deresinating.

Guayule (20% resin content) is suitable only for blending with Hevea or for friction stocks (in tire fabric plies, transmission belts, friction tape, etc.). Tires from underesinated guayule give a mileage 60% as great as tires from *Hevea* ribbed smoked sheet No. 1; from deresinated guayule (same quality as the lower grades of *Hevea*) the mileage is 90% as great. The cost of deresinating large quantities probably would not exceed 1¢ or 2¢ a pound.

If all the seeds available were planted immediately, there would be only enough seedlings to plant 45,000 acres of guayule in the Spring of 1942, which would yield about 1,500 long tons of deresinated rubber in 1943; 5,400 in 1944; and 21,300 in 1946. In 1943 there could be made available sufficient seedlings to plant 450,000 acres, which might yield 15,000 long tons in 1944; 54,000 in 1945; or 213,000 in 1947. Guayule production would utilize land and migrant labor not now employed and would not require large quantities of steel, chemicals, and chemical equipment.

[1] Abstracted from "Possibilities of Producing Rubber in the United States and Rubber Conservation." Issued by United States Tariff Commission, Washington, D. C., Sept., 1941.

# German Patents Relating to Vinyl Polymers—II

**Law Voge**[1]

THE next patent (17)[2] covers the esterification of the polymerized esters of vinyl alcohol such as produced by the process of German patent No. 281,687 (2)[3] by heating with high molecular weight acids or their esters. Especially applicable are acid resins, for example, rosin, copal, and synthetic resins such as are prepared by German patents Nos. 339,495 and 449,276.

Then application (18) was made for the protection of a process for the preparation of rubbery substances from castor oil and maleic acid or its anhydride.

The next patent (19) is stated to cover the discovery of products of industrial value from the reaction of formaldehyde with the polyvinyl alcohol as prepared in German patent No. 450,286 (9).[4] The reaction can be accomplished with the vapor of formaldehyde, its solution, solid para-formaldehyde, and formaldehyde derivatives. The reaction is accelerated by elevated temperature and by catalysts. The products are resinous rather than rubbery and resist temperatures of 180° C.

According to German patent No. 450,286 (9), polyvinyl esters can be transformed into polyvinyl alcohol by the use of saponification agents which unite chemically with the acetyl radical in some form. For this, of course, there is needed at least molecularly equivalent amounts of the agent binding the acetyl radical. It has now been found (20) that the polyvinyl alcohol can be prepared much more simply from polyvinyl ester by subjecting the ester to a true saponification split. For this, only small amounts of a catalyst are needed; for instance, oxides of heavy metals such as lead or high molecular weight sulphonic acids, such as alkylated naphthalene sulphonate.

A process (21) for the preparation of polymerization products of methylene ketone was covered next in a patent which cites the product of German patent No. 309,224 (6)[3] from certain classes of methylene ketones. On standing, these products have elastic properties, but months were required for their preparation; high temperatures could not be used to accelerate the process as large amounts of dimeric compounds would then be formed, affecting the quality of the polymerizate. It has now been found that certain classes of these ketones polymerize more quickly in the presence of much air, oxygen, or oxygen-yielding agents, such as peroxides. The process is improved also by the use of closed vessels.

Plastic products are produced by a process (22) supplementary to that of German patent No. 526,497 (15);[4] such products are insoluble or difficultly soluble in water and organic solvents. The polyvinyl alcohols of the reaction of the earlier patent are replaced by their organic ethers, etc., and the reaction is carried by heating to temperatures of 100° C. and over in the presence of small amounts of condensation reagents.

Synthetic elastic materials are produced by a process (23) which patents the polymerization of esters or ethers of vinyl alcohol in the presence of nitrogenous material, such as albuminous products, or derivatives thereof, such as peptone, peptide, diketopiperazine, amino acids, or other nitrogenous, preferably high molecular weight products. These products are said to be similar in many ways to natural rubber.

A process (24) was next invented for the preparation of transformation products of acrylic acid or its derivatives. It is known that acrylic acid and its derivatives can be polymerized by storage, illumination, heating, or distillation and that atmospheric oxygen favored this reaction. It had not, however, previously been possible to prepare acrylates in industrial quantities. In the present process oxygen-yielding agents, such as sodium perborate, are used for this purpose.

As early as 1880, Kahlbaum is said to have recorded the polymerization of acrylic methylate and to have formed a glass prism of it. This present invention (25) covers the preparation of such plastics of polyacrylic acid or its compounds or mixtures. The patent covers solely the products rather than the process.

A glass substitute forms the subject of the next invention (26) and is supplementary to patent No. 656,421 (25). The invention employs a process for the polymerization of acrylic acid or its derivatives.

The next patent (27) concerned a process for the preparation of polymerization products from aliphatic compounds which contain a double bond characterized in that these are polymerized in aqueous emulsion. The polymerization of organic esters or ethers of vinyl alcohols in the presence of organic nitrogenous compounds is not claimed.

In the following patent (28), by the same inventor, it is claimed that valuable polymerization products are formed from polymerizable aromatic hydrocarbons which contain an aliphatic chain with but one olefinic double bond when prepared in aqueous emulsion. The polymerization is performed without the use of increased pressure.

An elastic rubbery substance is prepared by a process (29) wherein formaldehyde is caused to react on polysulphides of alkali or alkaline earth elements, with or without dihalogen derivatives of the alkanes.

The inventors of the next patent (30) state that, to date, no process producing polymerizable products from vinyl halides and of industrial value was known. These products which had been obtained only in a quartz tube are now prepared by polymerizing vinyl halides under pressure and with very slowly rising temperature, particularly favorable results being obtained in solution. The temperature employed does not exceed 100° C.; the actual pressures are not stated.

The next patent (31) states that in Austrian patent No. 112,645 a process is described for making rubbery compounds by causing alkali or alkaline earth sulphides or polysulphides to react with halogen derivatives of saturated hydrocarbons of the alkane group. In the current patent it is said that similar rubber-like products are obtained by reaction between dihalogen derivatives of unsaturated hydrocarbons, for instance, isoprene, with alkali or alkaline-earth sulphides or polysulphides.

Rubbery or resinous substances are prepared according to a process (32), supplementary to that of patent No. 563,792 (16),[4] by increasing the aldehyde content of that

[1] Research chemist and engineer, Washington, D. C.
[2] For details on patents see end of this article.
[3] See INDIA RUBBER WORLD, Oct. 1, 1941, p. 37.
[4] *Ibid.*, p. 38.

reaction to over 15%, to obtain products, not for chewing gum, but for many varied uses.

A process for the preparation of synthetic material by polymerization of organic vinyl esters is covered in the next patent (33) which describes the preparation of a new type of synthetic amorphous material. The organic vinyl esters are commingled before or during polymerization with unsaturated halogenated hydrocarbons which alone are non-polymerizable.

The next patent (34) which forms a supplement to German patent (9),[4] claims that polyvinyl alcohol can be prepared by the saponification of inorganic polyvinyl esters in the presence of catalysts; for example, polyvinyl alcohol may be prepared from polyvinyl chloride in the presence of uranyl nitrate.

A patent (35), covering a process for the preparation of plastic substances from vinyl compounds, states that mixtures of vinyl esters and acrylates can be polymerized together, and also that polymerized vinyl esters and polymerized acrylates mixed together have valuable industrial properties for films, or lacquers, or as adhesives for splinterless glass.

The use of polymerization products of homologs of acrylic acid or of derivatives of their homologs or of their mixtures, is covered in patent (36). No less than 14 examples are included in this patent. Among the uses cited are coatings, films, synthetic leather, oilcloth, and lacquers. The inventors state that only a single member of the class of compounds covered by the invention, namely polyethylmethylacrylate, had been mentioned previously in a scientific publication.[5] On carrying out the polymerization process, first a rubbery product and finally a hard glassy substance are produced.

Another process for the preparation of polymeric vinyl alcohol appears in patent (37) which states that this compound had been previously prepared by the saponification of polymerized vinyl esters of organic acids, using potassium or sodium hydroxides in alcoholic solutions as saponification agents. Such polymerized vinyl alcohols contain ash (sodium or potassium compound) as has been proved. In this invention ash-free polymerized vinyl alcohol is prepared easily and simply from halogenated (especially chlorinated) polyvinyl esters such as polyvinyl monochloracetate or polyvinyl dichloracetate, rather than from the difficultly saponifiable acetate and propionate. The halogenated compounds may be obtained from the corresponding monomeric vinyl esters by the process of German patent (2).[3] Instead of potassium or sodium hydroxides, ammonia is used for saponification.

The well-known polymerization products of vinyl esters of this period had the defect that they contained certain amounts of free acid; for instance, the vinyl acetate obtained at low temperature contained some few tenths of 1% of acetic acid. This produces a defect in such lacquers if used on copper or brass as it causes greenish tints to develop, while it may cause corrosion on iron or aluminum. In patent (38) these defects were eliminated by employing organic bases soluble in organic solvents with the polymerizate. They both neutralize free acid as well as act as stabilizers to prevent decomposition.

The use of polymerization products of homologs of acrylic acid is covered by the next invention (39) which supplements patent (36). Six examples are presented for the preparation of films, buttons, dishes, and lacquers, particularly for leather and electrical resistances.

In another patent (40) formed synthetic plastics from polyacrylic acid or its compounds are covered. This patent is a supplement to patent (25). The inventors state that inorganic radicals can replace the organic radicals in the reacting materials of the basic patent. Seven examples are presented; the products are synthetic rubber, paper-like material, knife handles, buttons, billiard balls, phonograph records, artificial leather, linoleum, fountain pen holders, and drinking cups.

The applications for patent in 1929 begin with one (41) covering a process for the preparation of formed articles of synthetic resins by the spray process. The inventor states that by the method of metal spray-casting, polyvinyl compounds, such as polystyrol, can economically replace the gelatinized cellulose esters which are now used for this purpose. The polyvinyl compounds are sprayable and possess desirable thermoplastic properties.

Synthetic materials with desirable properties are obtained by forming mixed polymerizates of acrylic acid or its derivatives, such as esters, with phthalic esters as plasticizers, according to the inventors of patent (42).

The next patent (43) covers the condensation of polyvinyl alcohols with aliphatic aldehydes characterized in that the condensation is carried out in aqueous solution of strongly acid electrolytes.

Citing Austrian patent No. 112,645,[6] patent (44) states that the rubbery material formed according to that patent may be dissolved in carbon disulphide. When this solution is mixed with latex, a material is produced that will bond natural rubber to the artificial product.

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(39) No. 664,568. Appl. No. 27, 1928. Gr. Aug. 31, 1938. W. Bauer, assigned to Roehm & Haas.

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(44) No. 593,017. Appl. June 25, 1929. Gr. Feb. 20, 1934. J. Baer, Basel, Switzerland. (Unassigned.)


*(To be continued)*

[5] "Deaminization of Esters of Alamine and of Amino-Isobutyric Acid." A. L. Barker and G. S. Skinner, *J. Am. Chem. Soc.*, 46, 406 (1924).

[6] See description of German patent (31)

# A Scrap Rubber Dealer's Viewpoint

**A. Schulman**[1]

UNDER the pressure of the defense program and restricted consumption of crude rubber, reclaimed rubber consumption is rapidly increasing in relation to crude rubber consumed. In January of this year, reclaim consumption amounted to 28.7% of crude, but in September it had risen to 44.8%. This percentage figure can be expected to move higher, to 50% or above, as the full impact of crude restriction is felt later this year. Reclaim, the traditional conservation material for the rubber industry, is today preventing serious curtailment of production in many units of the industry, units which otherwise might have been dealt a crippling blow by crude restrictions.

But beyond this, reclaim should be regarded as a vital element in our rubber conservation program, and to meet any eventuality both industry and government should consider means of increasing the nation's backlog of reclaim and of scrap rubber, the basic raw material for the reclaimer. Under a 24-hour seven-day operating schedule, present reclaim plants, consisting of eight major plants and some 24 smaller units, can produce 300,000 long tons annually. Operations are approaching this level, but maximum production with existing facilities should be the goal. Further production increases could be achieved by eliminating many of the special reclaiming grades now tailor-made for certain compounding operations. Still greater amounts would result from curtailing the refining operation to some extent. While this would lower the quality proportionately, there may be certain applications where such a procedure would be justified.

Vital to the production of reclaim is an adequate supply of scrap rubber. Officials of the Office of Production Management had considered a nation-wide scrap rubber collection campaign similar to the aluminum campaign waged recently. It was finally decided, however, not to go through with the program because the existing dealers and their subsidiaries had a highly efficient system of scrap rubber collection already set up and functioning.

We have been using in the past 10 years only about 35% of the scrap rubber available. A large portion of the unused 65% has been destroyed as junk. But now that conservation of our entire rubber supply is vitally important to our national safety, the public should be taught that *all* rubber scrap, our potential reclaim supply, is valuable and should be saved—not destroyed.

Because water gets into tire casings stored outdoors and sometimes forms a mosquito-breeding place, some cities have required that scrap rubber be burned. In other cities, too far from reclaim plants for economical freight rates, thousands of tons of scrap have been burned. Even in communities relatively close to reclaiming centers, rubber scrap piles have been limited to old tires and tubes from which dealers secured the preferred grades, with the remainder being discarded. Other articles into which manufacturers have incorporated large percentages of crude rubber have been junked because reclaiming this rubber was too costly or cumbersome a process.

The days of waste are over! We must start saving thousands of old rubber articles—discarded garden hose, rubber from auto windshields, hot water bottles, tire beads which make up some 20% of a tire's weight, rubber gloves, sink mats, rubber toys, and a host of mechanical goods items.

In a nation of our geographical size, the task of maintaining a steady flow of thousands of tons of scrap rubber monthly to our reclaiming plants is not an easy one. It requires the competence and experience of the men who have been serving our reclaim industry for many years—the scrap rubber dealers. And the job of building up an emergency scrap rubber stockpile, quickly and efficiently, should be entrusted to these same men.

A brief outline of the dealer's function may serve to explain the necessity of experience in this type of work. To be assured of a steady supply of all grades and types of scrap, dealers must maintain constant contact with thousands of collectors operating in widely scattered communities throughout the country. The scrap rubber comes to the dealer in box car loads, all grades and types thrown in together, and is sorted by expert workmen in processing warehouses into the various classifications used by the reclaimers. In addition to grading the scrap, the dealer further sorts it for gravity, for uniform color, for size, and even for the type of compound used in the original article. Batteries of splitters separate the tires into various peels and carcass sections to give the reclaimer his exact requirements. For example, some reclaimers use only the tread stock of the scrap tire; while others want only gray or white carcass material and are not interested in the rest of the tire.

So much for the physical collection and preparation of scrap. What about the economic side of this picture? In the first place the scrap dealer has been a stabilizing influence on the market for many years. He is a constant buyer in the face of any and all conditions, purchasing and selling his scrap at a fairly level price, and because of this policy the reclaimer has been assured of a relatively stable price structure and has been protected against a corner in the market in times of great demand. Successful efforts have been made to keep shipping costs down and to prevent shortages of scrap in any particular locality.

The dealers in scrap rubber, moreover, are the direct means of keeping thousands of smaller dealers or collectors throughout the country in business. The dealer assures them of a constant market, pays them promptly on receipt of shipments to provide new capital for further collections, and informs them of changes in market conditions. In addition, the dealer teaches these small operators how to buy advantageously and how to sort and pack scrap rubber properly.

From this brief outline it is obvious that the problem of feeding the hungry maws of our reclaiming plants is not a simple one, but is a task that should be entrusted to experienced hands. Conservation of crude rubber is imperative. Important, too, is the rapid accumulation of large reserves of scrap rubber and reclaim.

[1] President, A. Schulman, Inc., Akron, O.

# EDITORIALS

## After December—What?

THE present rubber conservation program has been functioning well enough to permit a substantial increase in our stocks of crude rubber—from 339,108 tons at the end of June to 473,684 at the end of September. Without further relaxation in allocations during the fourth quarter, the end of this year should bring us somewhat above the 600,000-ton level, or near the original stockpile objective. But it may be considered as being quite likely that this objective will be revised upward. Furthermore a rubber conservation program for the early part of 1942 to replace the current plan which expires at the end of this year is now under construction.

Just what form the 1942 conservation plan will take is not known, but under the new organizational set-up in the Rubber and Rubber Products Branch of the OPM (reported elsewhere in this issue) provision is made for consideration of such measures as simplification, retreading, and product control, as well as direct allocation. This column has previously urged that manufacturers adopt simplification and retreading programs in the interest of conservation. These programs, however, although of vital importance, must now be considered as being supplementary to the main curtailment plan.

It would appear that a choice will have to be made between the present method of arbitrarily fixing the total permissible consumption and a system of product control whereby the maximum permissible crude rubber content of each product would be fixed. This latter system would have as a necessary corollary the restriction of quantity output in each line as determined in the light of the best interests of the country.

A system of product control would seem to have a sounder technical basis than that of the present plan. The arbitrary curtailment now in effect in some cases might tend to cut rubber content to the point where performance in service would be seriously impaired, and in other cases might permit a higher rubber content than is justified.

The rubber manufacturer, who has for many years been able to buy all the rubber he wanted at a relatively low price, has centered his development efforts on improving quality regardless of rubber content. Quality has been improved tremendously, and many thousands of tons of crude rubber have been saved through longer service life. But, we believe, the resourcefulness of the rubber technologist is such that he can maintain the *service life* of many products at their present level and yet reduce their rubber content appreciably. Perhaps, in some cases, tensile strength or other physical properties are higher than they need be for the intended service.

This concept of restriction by individual product control is not new. It was put in effect in Nazi Germany with reportedly good results. We believe that the plan can be carried out with still greater success in this country.

## A Costly Lesson

THE loss of 15,850 long tons of government rubber in the Firestone fire last month at Fall River was a serious blow to the nation's effort to accumulate a reserve supply of crude rubber. On the basis of 22½¢ per pound, this rubber was worth nearly $8,000,000, but the economic loss, great as it is, does not present a true picture of what this destruction means to our national defense effort. What could have been done with this vast store of rubber? For example, it could have been used to produce more than three million tires of the standard 6.00 by 16, four-ply type; it would have made possible the insulation of more than two million miles of size 14 wire (5/64-inch wall and 30% compound). We might go even further; the government rubber destroyed was nearly equal to the total amount of rubber consumed (15,970 tons) for boots and shoes during 1939, and considerably above that consumed (14,021 tons) during 1939 for the entire state of New Jersey. Also total shipments of crude rubber from Liberia, home of the Firestone plantations, were only 7,223 long tons in 1940, or less than half of the amount of rubber burned. These figures all illustrate that the amount of rubber involved was significant, that the loss was substantial—in fact a tragedy.

The first obvious lesson learned from this disaster is that the quantity of rubber stored in one location or building should not be excessive. We believe it is the duty of the Rubber Reserve Co. and of the government to find suitable storage facilities for its vast quantities of rubber, broken down into relatively small amounts and stored in relatively safe locations. And this should be done—no matter what effort is required. Further than this, individual factories should look to their own storage of crude rubber. Perhaps it is all stored in one vulnerable location—ready to be destroyed overnight.

All announcements on the fire indicated that it was not caused by sabotage. But it might well have been—and other similar stores of rubber might be the target of saboteurs. The publicity gained by this event might lead to attempts to sabotage our defense effort by destroying other stores of rubber by fire. The warning here is obvious.

Another lesson that should be learned, or in some instances re-learned, is that rubber is an extremely inflammable hydrocarbon—a dangerous fire hazard. In this respect rubber is even more vulnerable than ordinary fuel oil. The value of employe education on this point cannot be overemphasized.

To avert costly repetitions of such an occurrence, all those responsible for the safe storage of any rubber, government or industry-owned stocks, should thoroughly understand how to fight a rubber fire—and be assured that the proper fire-fighting equipment is on hand.

Beyond ample protection in the plant, assurances should be had that the fire fighting equipment of the community is sufficiently adequate to cope with a fire of this type. It should not be difficult *now* to convince fire officials of the seriousness of this hazard.

# What the Rubber Chemists Are Doing

## Rubber Division, A. C. S., Activities

### Dispersions Discussed at Buffalo Group Meeting

DISPERSION of rubber, natural and synthetic, was discussed at a meeting of the Buffalo Group, Rubber Division, A. C. S., held on October 3, at the Hotel Lenox, Buffalo, N. Y., with 43 members and guests in attendance. R. E. Nelson, of the Naugatuck Chemical Division of United States Rubber Co., presented a paper on "Rubber Dispersions"; while Benton Dales, E. I. du Pont de Nemours & Co., Inc., spoke on "Present Applications of Neoprene Latices."

Mr. Nelson, after reviewing briefly the characteristics of normal, centrifuged, creamed, and evaporated latices, went into a discussion of artificial latices made by redispersing solid rubber. The speaker pointed out that the first dispersions, made in 1922, were crude and uncertain, but further technical development resulted in better dispersions, using fixed rosin or oleate soaps. The most recent development, according to Mr. Nelson; is the use of volatile bases, as in ammonia soaps, which disappear from the film, leaving essentially the base stock; such dispersions are fast setting and water resistant. Crude rubber dispersions, it was pointed out, possess the advantage that all materials designed to react in the rubber (antioxidants, accelerators, plasticizers, etc.) can be added to the rubber on the mill to assure intimate contact; while other materials such as fillers, sulphur, and zinc oxide can be added during dispersion.

In referring to rubber quality, Mr. Nelson spoke of the high tensile strength (up to 6,000 pounds per square inch) and high modulus produced from natural latex films, but he also pointed out that these values are often in excess of what is needed or desired. On the other hand it was held that films from crude rubber dispersions are of lower tensile strength (up to 4,000 pounds per square inch) and lower modulus, and by the proper degree of breakdown of the crude rubber, dispersions can be produced which overcome the objections to latex in connection with such products as soft sheeting, laminations which handle and drape easily, balloons which are easy to inflate, and surgeon's gloves. Reclaimed dispersions, according to the speaker, yield soft films of low modulus, with tensiles up to 1,500 pounds per square inch, and such dispersions are used in sizing and saturation work; in certain adhesive applications such as shoe doubling; and for non-skid coatings on carpets. In conclusion, Mr. Nelson pointed out that it was significant that industries other than the rubber industry have made the most progressive use of rubber suspensions.

In his talk on neoprene latices[1] Mr. Dales discussed the general characteristics of these dispersions: small particle size, high specific gravity, and resistance to the action of oxygen, heat, sunlight, and oil. He then spoke of stability, pointing out that neoprene latex becomes unstable after a time: hydrogen chloride is evolved and the pH of the latex decreases. Despite this, Mr. Dales held, the present latices are relatively quite stable, but should be compounded within six months from the date of manufacture.

In regard to recent compounding developments, it has been learned that semi-reenforcing blacks and certain fine calcium carbonates improve the tear resistance; while certain petroleum derivatives (Sunaptic acid) improve the feel and appearance of films. Pine oil emulsion or alcohol may be used to expedite the passage of bubbles to the surfaces of mixes, it was disclosed; while water absorption has been reduced to 8% by use of certain petroleum derivatives and a total of 45% on the neoprene of such ingredients as lithopone, whiting, and carbon black. In conclusion Mr. Dales showed some of the products which are consuming 35,000 to 50,000 pounds of neoprene latex monthly: gloves, gaskets, impregnated cloth, belting, fire-resisting sponge, tank and pipe linings, cut and round thread, plating racks, etc.

[1] For further data on neoprene latex see INDIA RUBBER WORLD, April 1, 1940, pp. 43-45.

### Boston Group Hears Hauser on Rubber Situation

WITH 146 members and guests present, the fall meeting of the Boston Group, Rubber Division, A. C. S., was held at the University Club, Boston, Mass., on October 3. The two speakers for the occasion were Ernst A. Hauser, associate professor of chemical engineering, Massachusetts Institute of Technology, who discussed "Pertinent Facts about Imported, Home Grown, and Home Made Rubber," and Cedric Foster, war correspondent and news commentator of the Mutual Network, who talked on the current war with emphasis on the Russian campaign. At the meeting, Harold S. Liddick, chairman, announced the following nominating committee: J. C. Walton, Emil Krismann, and G. W. Smith. Officers are to be elected at the meeting of the Group on December 12 at the University Club, when the Farrel-Birmingham Co.'s motion pictures will be shown. It was also announced that the name of Vansul, Inc., had been omitted in the list of contributers at the outing last summer.

Prefacing his remarks by revealing President Roosevelt's recent announcement of this country's determination to keep the sea lanes free for United States shipping, Dr. Hauser presented a picture of the current crude rubber statistical position and then went on to discuss the possibilities of reclaiming synthetic rubber, and guayule in our rubber conservation program. The speaker urged that the following measures be taken: work toward a crude rubber reserve that will take care of two years' consumption; expand reclaiming capacity; maintain and support the production of those synthetic rubbers whose properties are desirable for special purposes, but avoid overexpansion of this industry; and support legislation that will permit the planting of reasonable acreages of guayule. Also plans should be worked out now, according to Dr. Hauser, in regard to permissible standard compounding formulations for various rubber goods, which would stipulate the amount of crude rubber, reclaim, and synthetics to be used and which would be put into effect in the event of a serious curtailment of our rubber shipments.

The speaker pointed out that reclaim can be stored for long periods under appropriate conditions, but emphasized that reclaim would provide only a temporary stop-gap in an emergency because rubber cannot be repeatedly reclaimed without seriously impairing its properties. Dr. Hauser also foresaw the possibility of developing a reclaim with properties that would make it competitive with synthetic rubber and said that a high-quality reclaim can now be made from any synthetic rubber, which is compatible with natural rubber or any synthetic rubber. But it was pointed out that in this process it is not necessary to separate the various synthetic rubbers before reclaiming.

In speaking of guayule rubber Dr. Hauser pointed out that this rubber was not so fully polymerized as *Hevea* rubber, but means had been found to continue the polymerization to give a comparable product. In a test compound using *Hevea* rubber, a tensile strength of 3,600 pounds per square inch was obtained; while deresinated guayule in the same compound gave a tensile of only 2,800 pounds per square inch. However, when the guayule was further polymerized by an inexpensive method, a tensile strength of 4,500 pounds per square inch was obtained. In this connection Dr. Hauser pointed out the tremendous possibilities in the field of high polymer research—research that would be aimed at improving the properties of *Hevea* rubber, guayule, and reclaim.

## Los Angeles Group

THE seventy-second meeting of the Los Angeles Group, Rubber Division, A. C. S., was held at the Hotel Mayfair, Los Angeles, Calif., on October 7 with 120 members and guests present. The meeting was sponsored by the Goodyear Tire & Rubber Co., with Mr. Mayo, general manager of the Pacific Coast Goodyear factory presiding. One of the two speakers, J. Douglas Wilson, superintendent of national defense training in the Los Angeles public schools, outlined the part the schools are playing in training men for special defense work. The other speaker, Prince Andrei Lobanov-Bostovsky, professor of history at the University of California at Los Angeles, gave an interesting talk on "History in the Making."

The door prizes and special prize were donated by Goodyear. The latter, a portable radio, went to R. E. Olds (Olds Alloy); while door prizes, Airfoam cushions, were won by Fred Wagner (U. S. Rubber), H. L. Oak (United Color & Pigment), and Bill Haney (Kirkhill Rubber).

## Contest Papers, Farrel Movies Feature New York Group Meeting

AT A meeting of the New York Group, Rubber Division, A. C. S., on October 17, at the clubrooms of the Building Trades Employers' Association, 2 Park Ave., New York, N. Y., 233 members and guests heard the three prize-winning papers of the Group's 1941 Essay Contest and saw the Farrel-Birmingham Co.'s motion pictures, "Rubber at the Rouge", "Robots and Rubber", and the "Mill Room of the Future". Booklets, containing three articles on modern and future rubber processing methods which were reprinted from INDIA RUBBER WORLD, were distributed by Farrel-Birmingham at the meeting.

The first prize-winning paper, "Economics of the Use of Neoprene Reclaim", by D. F. Fraser, E. I. du Pont de Nemours & Co., Inc., is presented elsewhere in this issue; while the third paper, "Cold Vulcanization of Rubber under Stress", by A. W. Beucker, Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., will be presented in the December 1 issue of INDIA RUBBER WORLD. The second prize-winning paper, "Manometric Test for Oxygen Absorption by Vulcanized Rubber", by R. H. Johnson, R. T. Vanderbilt Co., Inc., is discussed below. Three other papers received honorable mention in the contest: "Tri-Linear Compounding", by D. B. Forman, du Pont; "Accelerators for Latex; Water Soluble vs. Water Insoluble", H. H. Abernathy, du Pont; and "Conservation of Rubber Latex", R. O. Babbitt, Vanderbilt Co. Judges of the contest were: H. L. Fisher, U. S. Industrial Alcohol Co.; C. R. Haynes, Binney & Smith Co.; and W. C. Geer.

In Mr. Johnson's paper, which cites the work of C. Dufraisse in this field, a description of a manometric apparatus and method for determining the rate of oxygen absorption by rubber were presented. Test data for four different compounds were shown and compared with data from the oxygen bomb aging test on the same compounds. Curves plotted for the two different test methods fell in the same relative position, with differences showing up to a greater degree in the case of the oxygen absorption method. After pointing out that the new manometric method required about two hours against four days to two weeks for the oxygen bomb method, the speaker concluded that the rate of oxygen absorption test by the manometric method provided a convenient and rapid means for determining the aging characteristics of a rubber compound.

The annual Christmas party of the New York Group will be held Friday, December 12. As usual, tickets for nonmembers will cost more than those for members. No dues for 1941 will be accepted after December 1.

Election of officers will also take place at the December meeting.

## Chicago Group Plans Busy Winter Season

TWO motion pictures, "Robots and Rubber" and "Rubber at the Rouge," were shown by Andrew Hale, of the Farrel-Birmingham Co., Inc., at a meeting of 275 members and guests of the Chicago Group, Rubber Division, A. C. S., in the Casino Ballroom of the Congress Hotel, Chicago, Ill., on October 10. The following day members and guests attended a football game.

Arrangements are now being made for the combined dinner-dance and Christmas card party which the group will hold December 19 in the Gold Ballroom of the Congress Hotel. The Chicago Group will present its own orchestra with a complete show during the dinner. Bruce Hubbard is chairman of the affair.

A. A. Somerville, vice president of R. T. Vanderbilt Co., will present a paper entitled "Sunlight Aging Tests" at the next technical meeting of the Group, scheduled for February 5, 1942.

The following is a list of contributors to the Group's successful golf outing on September 20:

Percy H. Arden, L. Albert & Son, American Zinc Sales Co., Binney & Smith Co., Godfrey L. Cabot, Inc., Dearborn Chemical Co., E. I. du Pont de Nemours & Co., Inc., Farrel-Birmingham Co., Inc., French Oil Machinery Co., Genseke Bros., Herron & Meyers, Holmes Bros., International Smelting Co., Kraft Chemical Co., George S. Mepham Corp., H. Muehlstein & Co., Inc., Monsanto Chemical Co., Maywood Mold & Machine Co., Midwest Rubber Reclaiming Co., Naugatuck Chemical Division of United States Rubber Co., New Jersey Zinc Sales Co., Philadelphia Rubber Works Co., Stewart Bolling & Co., Inc., A. Schulman, Inc., Taylor Instrument Cos., Titanium Pigment Corp., G. J. Tagliabue Mfg. Co., R. T. Vanderbilt Co., Wishnick-Tumpeer, Inc., Xylos Rubber Co.

## Bolton S.C.I. Medalist

THE Chemical Industry Medal of the Society of Chemical Industry will be given to Elmer K. Bolton, chemical director of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., at a joint meeting of the American Section, S. C. I., the New York Section, A. C. S., and the New York Section of the American Institute of Chemical Engineers on November 7 at 8:00 p.m. at The Chemists' Club, 52 E. 41st St., New York, N. Y. C. M. A. Stine, vice president of the du Pont company, will speak on the personal side of the medallist's life, and Professor Roger Adams, of the University of Illinois, will speak on the technical accomplishments of the medallist. Dr. Bolton will give an address on "The Development of Nylon." He was intimately associated with the research leading to the development of neoprene and nylon. The medal is awarded for valuable application of chemical research to industry.

## Nominations Due for Charles Goodyear Lecturer

AS NOVEMBER 15, 1941, is the deadline for submitting names for the Charles Goodyear Lecturer, R. H. Gerke, chairman of the Charles Goodyear Lecture Committee, is urging all members of the Rubber Division, A. C. S., to send in at once their nominations to H. I. Cramer, secretary of the Division, c/o Sharples Chemicals, Inc., Philadelphia, Pa. The Committee is very anxious to select the second lecturer, who is scheduled to present his lecture at the fall meeting, 1942, of the American Chemical Society. Nominations should be accompanied by a statement setting forth the qualifications of the nominee with specific reference to the research on which the nomination is based. There should be seven copies.

## Address by Dr. Fisher on Natural and Synthetic Rubber

ON NOVEMBER 13, Harry L. Fisher, of U. S. Industrial Alcohol Co., Stamford, Conn., will discuss "Natural and Synthetic Rubbers" before the Northeastern Section, A. C. S., which will meet at Huntington Hall, Massachusetts Institute of Technology, Cambridge, Mass. Also on the program is a motion picture showing rubber processing at the Ford tire plant.

## John Ball Addresses Ontario Section

THE Ontario Rubber Section of the Canadian Chemical Association met October 16 at the University of Toronto, Toronto, Ont., with Norman Grace, chairman, presiding and 62 members and guests in attendance. The speaker was John M. Ball, of R. T. Vanderbilt Co., New York, N. Y., who presented a paper on "The Effect of Temperature on the Sunlight Deterioration of a Rubber Compound", a short abstract of which appears below.

It is thought this subject may be interesting to compounders because rubber goods in service are frequently subjected to sunlight over a fairly wide tempera-

ture range, and there are apparently very few references or comments in the literature on this subject. The study was made at four different temperatures, namely —30° C., +20° C., 70° C., and 100° C. — on thin dumbbell test specimens of one compound at one cure. There were two exposure periods: namely, four and seven hours in sunlight, on the roof of the Vanderbilt Laboratory in boxes provided with cooling or heating coils. Tensile tests were made before and after the two exposure periods, and a full set of control samples kept in the dark at each temperature was also tested. The net effect of sunlight is the difference between the total or overall change in tensile strength and any change that may have occurred in the control samples kept in the dark. Sunlight does have an effect at all the temperatures studied, and the effect increases with increasing temperatures up to 70° C. The effect at 70° C. is about twice that at 20° C.

The November meeting will be in Kitchener, November 14, at the Walper House, when W. B. Wiegand, of Columbian Carbon Co., New York, will address the gathering.

## Polyvinyl Resins

IN A paper before the Toronto Section, Society of Chemical Industry, on "Recent Developments at Shawinigan Chemicals Ltd.",[1] G. O. Morrison gave some interesting information on the polyvinyl acetate resins and hydrolysis products now produced on a large scale by Shawinigan. The important group of polyvinyl acetate resins, known as Gelvas, is produced from acetic acid with the aid of a mercury catalyst, and the process has been so improved that the yields of vinyl acetate, which at first were very small, are now 80% on the acetic acid reacted.

Another main group, the so-called Solvars, are products of hydrolysis of the polyvinyl acetates; while a third main group is that of the polyvinyl acetal resins. The latter, it is claimed, were discovered by Shawinigan long before anything on these resins had been published elsewhere. The polyvinyl acetal resins now in production include Formvars, Alvars, and Butvars, which are produced by combining acetate hydrolysis products, respectively, with formaldehyde, acetaldehyde, and butyraldehyde. An extremely large variety of resins can be produced from a single Gelva, it is explained.

Concerning the uses of the different products, the Gelvas serve as lacquers, adhesives, coatings, impregnations, and as base for chewing gum. Solvars are most suitable for film forming and sizing materials and emulsifying agents, as well as for adhesives and coatings; while Formvars are employed not only for lacquers, coatings and impregnations, but also in molding, as interlayer in safety glass, wire enamel, sheets, and plastics.

[1] *Chemistry and Industry*, 60, 387 (1941).

## Carman Addresses Detroit Group on Synthetic Rubber and Priorities

AT THE October 3 meeting of the Detroit Rubber & Plastic Group, held at the Detroit-Leland Hotel, Detroit, Mich., the principal speaker was Frank Carman, of the Synthetic Rubber Section, Chemicals and Allied Products Branch, Office of Production Management. Also on the program were the two motion pictures of Farrel-Birmingham & Co., Inc., presented by Andrew Hale. A résumé of Mr. Carman's talk follows.

Mr. Carman, after giving a picture of priority control in general, pointed out that early in 1941 there was an acute shortage of synthetic rubber that made mandatory control and industry-wide allocation necessary. From data obtained through a questionnaire, production is classified as defense, non-defense, and indeterminable or indirect defense, with all allocations of synthetic rubber by product. The problem of classifying the various products was emphasized, and a number of examples were cited to show how an individual product was given preference over another type of product based on relative importance.

The speaker went on to say that synthetic rubber now plays a major role in defense, estimating that 78% of the present supply is used in this manner with approximately 60% of all defense allocations entering into the aircraft classification. Volume uses cited were: bullet-proof tank linings, fuel and oil line hose for aircraft, general oil and gasoline hose for the Navy, wire and cable for marine and aircraft use, gas-proof clothing and fabric treatment in general, barrage balloons, aircraft molded parts, cement, packing and gaskets, steel mill rolls, and protective coating for steel mill equipment.

It was estimated that there will be 25,000,000 pounds of synthetic rubber produced during 1941, with 48,000,000 and 70,000,000 pounds forecast for 1942 and 1943, respectively. Stocks on September 1, 1941, were reported to be about one month's supply, and it was believed that existing plants and projects now under way will have sufficient capacity for all military, indirect, defense, and civilian requirements. The total requirements for 1941, military and essential civilian, were estimated at roughly 22,000,000 pounds. Remarks up to this point were confined to the oil-resistant types of synthetic rubber.

In speaking of the general-purpose synthetics to be produced in four government plants, Mr. Carman had this to say: "Early in 1943 these plants should be in production with an annual capacity of 89,000,000 pounds. The tire companies will be expected to use this rubber, and some definite educational program for its use probably will be set up in the near future. New manufacturing capacity will be required for approximately 35,000 tons of butadiene and 13,000 tons of styrene per year as raw material for the general purpose rubber. The Reconstruction Finance Corp. is now negotiating for the construction of these units."

Construction of a "butyl rubber" plant with an annual capacity of 4,800 tons should be started within the next few months, according to the speaker. The plasticized polyvinyl chloride and vinyl chloride-acetate copolymer resins, Mr. Carman pointed out, are used for defense with large amounts for wire insulation and sheathing and for coating fabrics. Production of these resins for 1941 is estimated at 9,400,000 pounds, with 23,000,000 pounds forecast for 1942; these amounts represent about 15,000,000 and 40,000,000 pounds, respectively, when plasticized. It was noted that plasticized resin production forecast for 1942 is greater than total synthetic rubber production in 1941.

It was reported that, because the supply of certain grades of synthetics was critical, the Materials Divisions of the Army Air Corps, the Navy Aeronautical Section, and the Bureau of Ships, together with the Rubber Manufacturers Association Technical Committee did excellent work in changing specifications to allow the use of alternate grades. In this connection it was pointed out that intense compounding research can often overcome differences in the properties of the various synthetics. Mr. Carman expressed the belief that the curtailment of certain synthetic rubber product lines will be over during the first quarter of 1942, and said that the OPM sincerely hopes that priority restrictions on synthetic rubber can be lifted in the near future.

## Mold and Mandrel Lubricant

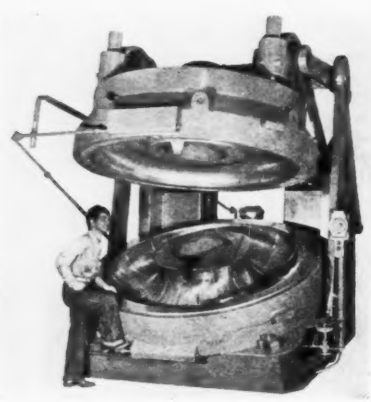
COLITE, a concentrated mold and mandrel lubricant, is not a metallic fatty acid combination, but an ester solution that, in addition to simplifying the removal of cured rubber from molds, imparts a transparent satin-like finish to the surface of the goods, according to the manufacturer, The Beacon Co., 89 Bickford St., Boston, Mass. Non-toxic, non-tacky, and odorless, Colite is diluted with eight parts of water when used as a general mold lubricant.

## Activating Mineral Filler

3X MINERALITE, a finely wet-ground, white muscovite with a specific gravity of 2.26 is claimed to manifest both activating and accelerating properties in most types of rubber compounds. Because of this, the zinc oxide content may reportedly be reduced to 1% or 1.5% on the rubber, and the accelerator content may also be lowered.

It is further claimed that Mineralite may be used advantageously as a substitute for other mineral fillers and that it may readily be incorporated in all kinds of synthetic rubbers. A product of Mineral Mining Corp., Mineralite is distributed by Mineralite Sales Corp.

# New Machines and Appliances



McNeil Inner Tube Press

### Giant Vulcanizing Press for Inner Tubes

WHAT is believed by the manufacturer to be the largest individual inner tube vulcanizing press ever built is shown here. The press is known as Model No. 500-85-30; this number indicates that the press will withstand 500,000 pounds total internal pressure, is 85 inches wide between the side arms, and will accommodate a mold with a maximum overall outside thickness of 30 inches. The maximum size of tube mold cavity which can be used in the press is 22 inches in cross-sectional width and 76 inches outside diameter. The press features an upper platen, adjustable by means of a motor drive to accommodate various mold thicknesses; this innovation is said to greatly simplify and speed the mold changing operation.

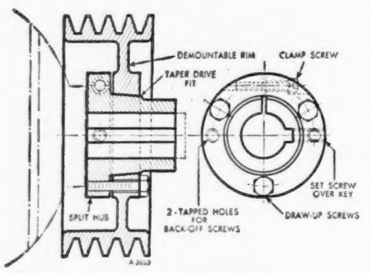
The mold shown in the press is for curing 24.00 by 32 inner tubes used on large earth-moving equipment, and the weight of the vulcanizer, together with this mold, is approximately 37,000 pounds. In the illustration the low and accessible position of the front end of the mold can be noted. The McNeil Machine and Engineering Co., Akron, O.

### Nylon Bristles Used in Brushes For Rubber Manufacturing

NYLON bristles, which for industrial brushes reportedly have outworn natural bristles by from two to four times, are now utilized in a line of brushes which may be employed in rubber manufacturing for rolling the beads or reenforcements on openings of rubber products, for stripping the finished product from its form or mold, and for applying glycerine to the form or mold to prevent the rubber from adhering. Nylon bristles, which are manufactured in mechanically controlled diameters, remain firm when moist and dry rapidly, it is claimed. The nylon used in the brushes, which are manufactured by The Herold Mfg. Co., is produced by E. I. du Pont de Nemours & Co., Inc., Arlington, N. J.

### Quickly Detachable Sheaves For V-Belt Drives

ACH sheave unit of the Q-D V-belt driver sheave, said to be suitable for quick mounting of sheave to shaft and dismounting from shaft, consists of two parts, a longitudinally-split or clamp hub and a V-grooved rim. The hub is clamped to the shaft by a cap-screw in its flange and is securely fastened by a standard keyway. The rim is taper-fitted to the hub and is fastened with three draw bolts. To remove the rim, the draw bolts are withdrawn, and two of them are inserted into holes so tapped in the rim that the bolts act as jamb screws and bear against the hub, forcing the rim off the taper without disturbing the position of the hub. Worthington Pump & Machinery Corp.




Q-D V-Belt Driver Sheave

### Pinhole Detector

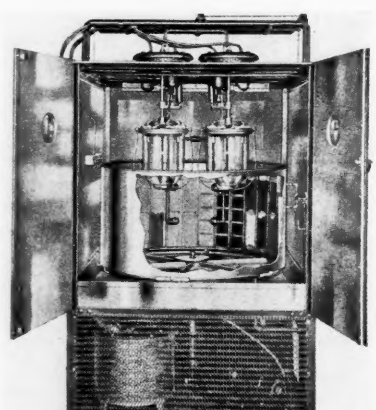
A PINHOLE detector, designed specifically for detecting pinholes in steel strips, would be applicable to opaque or nearly opaque sheets of rubber with some slight engineering modifications, according to Westinghouse engineers. As the device operates by photo-electric principles, a thin latex sheet would probably transmit so much light that the increased light passed by a small hole would not be large enough to provide sensitive operation. Also the application of the device to rubber sheeting would depend somewhat on the size of hole to be detected.

Capable of detecting holes 1/64-inch and smaller in diameter in tin mill strip traveling at speeds of 100 to 1,600 feet per minute, the hole detector consists of a light source, a photo-tube housing, and a control unit. The light source is mounted above the strip and provides intense illumination over the full width of the strip. The photo-tubes are contained in a heavy, dust-tight, welded sheet housing which may be mounted directly on the mill structure underneath the strip with the distance from sheet to the top of the shutter guide on the housing maintained at about one-half inch. Westinghouse Electric & Mfg. Co.

### New Atlas Twin-Arc Weather-Ometer

THE new Atlas Twin-Arc Weather-Ometer has been developed to meet the need of an apparatus that will provide more greatly accelerated test results in duplicating outdoor weather than previous equipment of this type, according to the maker. The new Weather-Ometer, which requires no operator attention except inspection of samples and reloading of the arcs once every 24 hours, is said to combine the effects of sunlight, rain, heavy dew, and thermal shock, producing test results in days instead of months out of doors.

Two enclosed violet carbon arcs provide active light at the surface of the samples, which is equivalent substantially to noon June sunlight in intensity and wave length distribution. Periodic use of cold water sprays (preferably at 45° F.) on the samples creates a high thermal shock, which, coupled with the deterioration caused by the ultra-violet light, produces the checking, cracking, and loss of elasticity and color retention found in actual weathering. Light and water spray cycles are controlled by a robot cycle timer; while testing chamber temperature is maintained constant by a blower system, controlled by a dial-type thermo-regulator. According to the manufacturer, the new Weather-Ometer is applicable to materials such as bitumens, paint, lacquer, varnish, plastics, fabrics, and rubber. Atlas Electric Devices Co.



New Atlas Weather-Ometer

# New Goods and Specialties

"Swim-FinS"

## Rubber Fins Increase Swimming Speed

USING no metal or cloth in their manufacture, but only a pure gum stock based on 98% No. 1 ribbed smoked sheets, "Swim-FinS" are triangular devices which may be fastened to a swimmer's feet for the purpose of giving more power to his leg action and increasing his swimming speed. When they are made, the rubber is molded in aluminum molds and cured for 30 minutes. Adapted from the fish-like fins Tahitian natives attach to their feet to increase their proficiency at pearl-diving and fish-spearing, "Swim-FinS" are recommended by life guards and swimming coaches for teaching the novice the correct use of his feet, conserving the swimmer's energy, and use in life-saving operations. A pair of "Swim-FinS" weighs approximately three pounds. Owen Churchill.

## More Cords Used in Texrope Super 7 V-Belt

FEATURING smaller cords which permit the use of more cords per belt, the new Texrope V-belts are of the Super 7 laminated design which is based on the Vogt formula. A rubber bottom cushion is said to minimize operational impacts; while the central cord portion reportedly transmits power at the effective pitch diameter. Internal belt degeneration is reportedly lessened by embedding each cord individually in rubber. The bias cut of the fabric is claimed to prevent "dishing" and to maintain transverse stability. The two-ply fabric cover is impregnated with rubber. Allis-Chalmers Mfg. Co.

## Self-Sealing Fuel Hose

A SELF-SEALING fuel hose with an inner surface lining of Ameripol reportedly prevents fuel leaks even under 10 to 15 pounds' pressure despite numerous punctures by high caliber machine gun bullets. Used largely for connecting fuel tank cells and engine superchargers, the hose has a total wall thickness of less than $\frac{5}{16}$-inch, and it ranges in diameters from ½-inch to three inches. The B. F. Goodrich Co., Akron, O.

## Curing Bag Uses Steel Wires in Place of Cotton Cord

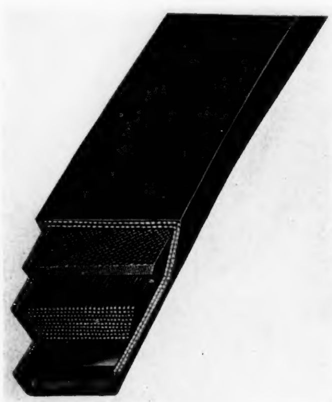
STRANDS of steel piano wire replace the usual cotton cords in sectional steam and air bags recently developed for tire repairing. Tests of the new-type bags show that some are still in good condition after 700 cures, and it is claimed that the average increase in number of cures with wire bags, as compared with cord bags, is over 100%. According to the manufacturer, the longer service life results from the use of the steel wire, which reportedly is ten times stronger than cotton cord and which will not disintegrate at high curing temperatures. Also the lateral stretch and overall flexibility of the bag is said to be increased because only a few wires are calendered in every inch of rubber.

The new wire bag, which has only one ply in passenger sizes, does not lose its shape by "growing"; may be retreaded; does not tend to buckle in the mold; and eliminates the possibility of ply separation, according to further claims. The Firestone Tire & Rubber Co.

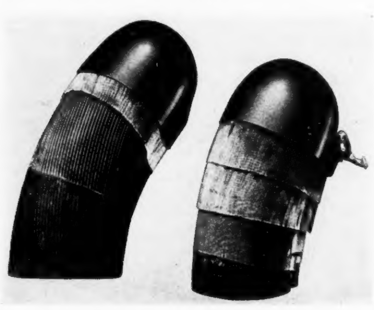

**This "Seamless 555" handball, said to have required experimentation with 48 different rubber compounds in its development, is easy on the hand and features a smooth surface and a balance that insures the same rebound regardless of the point of contact, according to the maker, The Seamless Rubber Co.**

## Polyvinyl Alcohol Gloves

TO PREVENT oils and solvents, such as workers encounter in metal-working and dry-cleaning industries, from coming into contact with the skin where these materials might cause such occupational diseases as folliculitis and dermatitis, elbow-length gloves made of Resistoflex PVA (polyvinyl alcohol) have been designed. The gloves, which are transparent, contain no sulphur and consequently will not tarnish metal surfaces. They are said to possess high resistance to tearing and abrasion and to be resistant to sulphur-base cutting oils, petroleum or naphtha solvents, carbon tetrachloride, trichlorethylene, perchlorethylene, benzol, ether, chloroform, ethylene dichloride, or mixtures of any of these. The gloves are also claimed to be sufficiently flexible to afford unrestricted movement of the fingers. Resistoflex Corp.



**Sectional View of Super 7 V-Belt**



**Sectional Views of Wire Curing Bag *(Left)* and Cotton Cord Bag**

**Resistoflex PVA Gloves**

# UNITED STATES

## Rubber Branch of OPM to Prepare 1942 Rubber Program

According to Barton Murray, chief, Rubber and Rubber Products Branch, OPM, a new order to govern the consumption of crude rubber in this country during the early part of 1942 is expected to be issued by the first part of December. The new order will take the place of the current General Preference Order M-15, which expires at the end of this year. To insure that the program will be carried out impartially and with as few dislocations as possible, but always consistent with the interest of national defense, the Rubber and Rubber Products Branch will listen to the views expressed by the various groups affected by government policies. Thus, the rubber branch was scheduled to meet late last month with the OPM Rubber Labor Advisory Committee, small tire producers, and the Rubber Industry Advisory Committee.

As indicated in the organizational setup given below, future rubber conservation measures of the OPM may include restrictions involving simplification, retreading, and actual product control. It is expected that from time to time experts within the rubber industry will be called on for advice on technical problems peculiarly within their provinces. None of the industry experts, however, will have access to the confidential data filed with the Rubber and Rubber Products Branch by members of the industry, nor will they have any part to play in policy determination.

### Organization

The Rubber and Rubber Products Branch is now organized into five general sections, all coming directly under Mr. Murray, and appropriate subdivisions as follows: *Staff*—statistical, clerical, correspondence, and stenographic; *Consultants*—legal, labor, civilian supply, priorities, and research and statistics; *Technical*—materials unit (rubber, fabric, chemicals, reclaim, metal, miscellaneous), equipment unit (machinery and equipment for the rubber industry), and products unit (tires and tubes, mechanical goods, footwear, rubberized materials, hard rubber, flooring, and sundries); *Policy*—procedures unit (allocations and quotas) and distribution unit (government orders); *Conservation*—stockpile, retreading, waste utilization, simplification, and product control.

### Personnel

Mr. Murray drafted the civilian allocation program for rayon yarn and was engaged in other activities in the textile field under the Division of Civilian Supply. An economist and graduate of Columbia University, Mr. Murray was in charge of codes for more than 400 industries as Division Administrator of the NRA. His home is near Campbell

*O.E.M. Defense Photo*

**Barton Murray**

Hall, Orange County, N. Y., where he maintains a large cattle breeding farm.

Budd E. Pollak is the administrative assistant who supervises the work of the Branch staff, interviews and consults with representatives of the rubber industry, coordinates certain work of units within the Branch set up to act on supply and distribution problems within the rubber industry, and acts as liaison between the Branch and other divisions of OPM. Mr. Pollak, who received his B.A. from Harvard in 1932, was previously connected with the Shell Co. in the Far East; M. Samuel & Co., Ltd., London; J. & W. Seligman & Co., (working on the debt problems of several nations); and Union Securities Corp. (new financing and distribution of securities).

E. Howard Roorbach is administrative assistant charged with the assembly and coordination of statistical information necessary for decisions in which consideration of such data is essential. He received his B.A. from Harvard in 1934 and M.B.A. from the Harvard Business School in 1937. From 1937 to 1941 he was with the Automatic Electric Co., Chicago, doing research analysis of sales and distribution.

Maurice Judd is administrative assistant to act on problems of a miscellaneous nature. He is a graduate of Indiana University, 1913, and National Law School, 1926; and is a member of the Bar of the District of Columbia. For some years he was chief of the Washington Bureau of the New York *Sun*, resigning in 1929 to practice law. He was also assistant to Mr. Murray in the NRA.

Sidney C. Sufrin, labor consultant, is an economist with the U. S. Department of Labor, Bureau of Labor Statistics, and is on loan to the Labor Division of OPM. He received his B.A. from the University of Pennsylvania and his Ph.D. from Ohio State University. He was on the Labor Advisory Board of the NRA from 1933 to 1935; consultant to the National Resources Committee in 1936-7; member of the staff of the International Labor Office at Geneva in 1938-39; and Rockefeller fellow in Europe, working on labor policy and the business cycle.

Bernard P. Holland, Jr., acting counsel for the Branch and a member of the Bar of the State of Virginia was graduated from the law school of the University of Virginia in 1923, engaged in the general practice of law in Norfolk, and then was with the legal department of the Seaboard Air Line Railway. For more than six years he was in the legal division of the Reconstruction Finance Corp., dealing with loans to business enterprises, the last four years of which were spent as chief assistant to the general counsel in charge of all legal matters relating to such loans.

Robert T. Williams is the priorities specialist assigned by the Priorities Division to the Rubber and Rubber Products Branch. For some years he was connected with various corporations, including the Firestone Tire & Rubber Co., Texas Co., and National Cash Register Co. He was a business specialist with the Department of Commerce from 1931-33; an economic advisor in the NRA in 1933-34; a private business consultant; and from 1938 to

## CALENDAR

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| Nov. 3-5. | American Institute of Chemical Engineers. Cavalier Hotel, Virginia Beach, Va. |
| Nov. 4. | Los Angeles Rubber Group. Mayfair Hotel. |
| Nov. 7. | Akron Rubber Group. Akron City Club. |
| Nov. 11-30. | Red Cross Roll Call. |
| Nov. 14. | Ontario Rubber Section. Walper House, Kitchener, Ont., Canada. |
| Dec. 1-5. | A.S.M.E. National Meeting, Hotel Astor, New York, N. Y. |
| Dec. 1-6. | 18th Exposition of Chemical Industries. Grand Central Palace, New York, N. Y. |
| Dec. 2. | Los Angeles Rubber Group. Mayfair Hotel. |
| Dec. 12. | Boston Rubber Group. University Club. |
| Dec. 12. | New York Group. Christmas Party. Building Employers' Trade Assn. Clubrooms. |
| Dec. 19. | Chicago Rubber Group. Dinner-Dance and Christmas Card Party. Congress Hotel. |
| Dec. 29-30. | A. C. S. Division of Industrial and Engineering Chemistry. Eighth Annal Symposium. Cleveland, O. |
| Dec. 29-31. | A. C. S. Division of Organic Chemistry. Ninth National Organic Chemistry Symposium. Ann Arbor, Mich. |
| Jan. 12-16. | S.A.E. Annual Meeting and Engineering Display. Book Cadillac Hotel. Detroit, Mich. |

1941 was chief of the Industry Section of the Federal Housing Administration.

This staff is supplemented by a consultant from the division of Civilian Supply and from other branches of OPM on problems within their fields. A number of economists, analysts, and statisticians work under the direction of the branch chief and his three administrative assistants. Offices of the Rubber and Rubber Products Branch are in Room 3360, Social Security Bldg., Fourth and Independence Ave., S.W., Washington, D. C.

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### Rubber under Export Control

The following is a complete list, up to October 1, 1941, of rubber and rubber products subject to export control, as revealed by the Administrator of Export Control, Washington, D. C.:

Camelback.
Canvas shoes with rubber soles.
Clothing of rubber or of rubberized cloth. (Include rubber aprons, baby pants, bibs, bathing suits, capes, raincoats, etc.)
Druggists' rubber sundries (except surgeons' and household gloves; include rubber sponges).
Electrical hard rubber goods, other. (Include parts of battery boxes.)
Gutta percha manufactures. (Include gutta percha compound.)
Hard rubber goods, other (except electrical).
Hose and tubing, other.
Latex or other forms of rubber compounded or processed for use in further manufacture. (Include rubber sheets, compounded, or processed, and master-batch.)
Rubber balloons (except toy balloons and balloon novelties).
  and balata belting, other.
  bands.
  belts, fan, for automobiles.
  boots.
  casings, automobile.
    truck and bus.
    and tubes, other.
  cements.
  combs, finished.
  crude.
  electrical battery boxes. (Include composition and part rubber.)
  erasers.
  and friction tape.
  bathing caps.
  garden hose.
  gloves and mittens.
  heels.
  hose, other.
  mats, matting, flooring, and tiling.
  packing.
  reclaimed.
  scrap containing 5% or more rubber.
    less than 5% rubber. (Include used casings averaging less than $2 each.)
  shoes.
  soles.
  soling and toplift sheets.
  thread, bare, (uncovered).
    textile covered.
  tires, solid for automobiles and motor trucks.
  tubes, inner, for automobiles.
  water bottles and fountain syringes.
Rubberized automobile cloth. (Include rubber coated and rubber combined cloth.)
  piece goods and hospital sheeting, other. Include raincoat, apron, crib, piano and organ bellows, backing, adhesive, and typewriter cover.)
Solid tires for automobiles and trucks, other.
Synthetic rubber sold in bulk as raw material.
Tire sundries and repair materials, other than camelback.
Rubber compounding agents of coal-tar products. (Include accelerators, retarders, and antioxidarts.)
  (not of coal-tar origin).
Rubber-like compounds, synthetic, fabricated.
  unfabricated.

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**United States Department of Labor,** Wage and Hour Division, Washington, D. C., has ruled that employes engaged in retreading or recapping tires for interstate commerce must generally be paid the 40¢ an hour minimum wage required under an industry wage order for the rubber products manufacturing industry.

## Workings of the Rubber Reserve Co.

H. J. Klossner, president of the Rubber Reserve Co., Washington, D. C., on September 12 released Circular No. 1, (as below), which outlines the procedure followed by the Rubber Reserve Co. in distributing rubber to manufacturers.

### General

1. Rubber Reserve Co. will sell rubber to manufacturers ex dock or ex warehouse or F.O.B. cars New York, Boston, Baltimore, New Orleans, Los Angeles and/or San Francisco, at the option of Rubber Reserve Co. at the prices listed on the attached schedule.[1]

2. Rubber will be sold on a 10% examination and net test weight basis and payment therefor will be required at the time of delivery, by certified check payable to Rubber Reserve Co. It will, therefore, be necessary for manufacturers or their dealer agents to weigh and inspect at point of delivery. No adjustments will be made after delivery and acceptance. Rubber Reserve Co. will absorb the cost of the weighing and inspecting in all cases, but if delivery is made ex warehouse, the charge for reweighing and reinspecting shall not exceed 80¢ per ton.

3. Requests for the purchase of rubber should be addressed to Sales Department, Rubber Reserve Co., 811 Vermont Ave., Washington, D. C., and mailed at least 30 days in advance of the date on which delivery is desired. All such requests must state clearly the type or types of rubber required, the quantity of each type or types, and the desired delivery date. If it is the manufacturer's expectation that the delivery will be taken in several lots, a statement to this effect should be included in the request.

4. The amount of rubber which Rubber Reserve Co. will sell to any manufacturer for consumption during any particular month will be governed by the amount of rubber which the manufacturer is permitted to consume, pursuant to the terms of General Preference Order, Number M-15 as amended and supplemented, issued by the Division of Priorities of the Office of Production Management on June 20, 1941.

5. Upon receipt of the manufacturer's request, Rubber Reserve Co. will issue and forward to the manufacturer, by registered mail, a Crude Rubber Purchase Permit, in triplicate, authorizing the manufacturer to receive the amount of rubber to which it is entitled. If it is indicated in the request that delivery is desired in several lots, a permit will be issued to cover each delivery. The permit must be executed in triplicate and delivered to the Agent of Rubber Reserve Co. at the time the rubber is received. The triplicate copy, which will represent an invoice, will be returned to the manufacturer for its files.

### Distribution by Distributing Agent

1. D. D. Haldane, 95 Broad St.,[2] New York, New York, has been appointed as Distributing Agent for Rubber Reserve Co.

2. In order that there may be the least possible dislocation in the usual channels of distribution, it is assumed that most manufacturers will prefer to have dealers act as their agents in purchasing rubber from Rubber Reserve Co., and in connection therewith, render certain services as has been the custom in the past, such as weighing, inspecting, shipping and financing. However, this procedure is not obligatory and, should they so desire, manufacturers may arrange for their own deliveries, subject to the conditions contained in Paragraph 2 under "General."

3. In order to avoid unnecessary handling charges, deliveries will be made ex dock wherever possible.

4. To facilitate distribution by the Distributing Agent, the rubber presently stored in warehouses of the American Dock Co. and Pouch Terminal, Inc., New York City, will be used as a stock pile. All distributions to manufacturers will be made from such warehouses in accordance with the established custom of the trade, and exceptions will be made only when the requested type of rubber is not available. These stock piles, consisting of various grades of rubber deemed adequate to satisfy ordinary consumption demands, will be replenished from time to time by incoming shipments.

5. In cases where the services of a dealer are utilized, the *Rubber Manufacturer's Endorsement* on the reverse side of the permit must be executed by the manufacturer and the permit in triplicate forwarded to the respective dealer. The dealer will then present the permit to the Distributing Agent, who will arrange for the delivery of the rubber described therein. Upon receipt and acceptance of the rubber, the dealer will execute the *Dealer's Acceptance* in triplicate and surrender the permit to the Distributing Agent, accompanied by a certified check covering the purchase price of the rubber. The Distributing Agent will then sign the permit in triplicate, in the space provided therefor, and deliver the triplicate copy thereof to the dealer for transmittal to the manufacturer.

6. Dealers who act as agents for manufacturers and reweigh and reinspect rubber at warehouses should, at the end of each month, render to the Distributing Agent an invoice covering charges for such services on the basis of not more than 80¢ per ton. The Distributing Agent will check the invoice against the deliveries and, if found to be correct, indicate his approval thereon and forward the invoice to Rubber Reserve Co. for payment.

7. The Rubber Trade Association of New York, Inc., has prepared the following schedule of fixed charges (exclusive of any charges for weighing and inspecting which will be absorbed by Rubber Reserve Co.) to be made by dealers when acting as agents for manufacturers:

| Tons | ¢ per Lb. | Days |
|---|---|---|
| 750 and over | $\frac{1}{16}$ | Cash 20 |
| 100 to 750 | $\frac{3}{16}$ | 30 |
| 30 to 99 | ¼ | 30 |
| 10 to 29 | ½ | 30 |
| Less than 10 | ¾ | 30 |
| Case lots | 2 | 30 |

The foregoing charges (which are for the account of the manufacturer and not Rubber Reserve Co.) are intended to apply to the entire volume of rubber handled for any manufacturer during a single month, irrespective of the number of individual deliveries made or the number of dealers involved.

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[1] See our Oct., 1941, issue, p. 58.
[2] The office moved on Oct. 11 to 15 William St. EDITOR'S NOTE.

#### Distribution by Buying Agents

1. It is assumed that the requirements of certain manufacturers will be sufficient in amount to permit acceptance of the entire quantity of rubber covered by one or more bills of lading or warehouse receipts. In any case in which a manufacturer desires a quantity of rubber less than that specified by a single bill of lading or a single warehouse receipt, delivery will be made through the Distributing Agent as provided under "Distribution by Distributing Agent" unless Rubber Reserve Co. determines otherwise. The same procedure will be followed in any case in which a manufacturer desires to utilize the services of a dealer.

2. In order to avoid unnecessary handling charges, deliveries will be made ex dock wherever practicable. Arrangements will also be made, in so far as possible, to permit manufacturers which operate Eastern Plantations to purchase the rubber produced on their respective plantations for use in their American factories.

3. In certain cases if a manufacturer can accept the entire quantity of rubber covered by one or more bills of lading or warehouse receipts, it is believed the Buying Agents of Rubber Reserve Co. can handle the delivery. If the rubber is delivered ex dock to a manufacturer, or to a dealer-agent of a manufacturer not represented by the Buying Agent making the delivery, it is assumed that such manufacturer will have its dealer-agent representative present when the rubber is weighed and inspected. If, however, the Buying Agent is the representative of the manufacturer which is purchasing the rubber, the weighing and inspecting thereof will be arranged for by the Buying Agent. When the rubber is accepted, the *Rubber Manufacturer's Acceptance* or *Dealer's Acceptance* on the reverse side of the permit will be executed by the purchaser, and the permit in triplicate, accompanied by a certified check representing the purchase price of the rubber, delivered to the Buying Agent. The Buying Agent will then sign the permit in triplicate in the space provided for the signature of the Distributing Agent, and deliver the original, accompanied by said certified check, to the Federal Reserve Bank of New York. The duplicate copy should be immediately forwarded to Rubber Reserve Co. and the triplicate copy returned to the manufacturer.

4. If it is not possible to make deliveries ex dock to manufacturers represented on the Buying Committee, delivery will be effected ex warehouse, and the rubber so delivered, wherever possible, will be rubber which was originally purchased for the account of Rubber Reserve Co. by the Buying Agent whose company is to receive the delivery. In cases of this nature, the Federal Reserve Bank of New York will be authorized to deliver the warehouse receipts to the manufacturer, upon receipt of a certified check covering the purchase price.

5. If the request of a manufacturer who is not represented on the Buying Committee cannot be satisfied by a delivery ex dock, or if it is not feasible to employ one of the Buying Agents to handle the transaction, delivery will be made ex warehouse in the manner considered most practicable, preferably through the delivery to the manufacturer, or to his dealer-agent, of a warehouse receipt against a certified check covering the purchase price.

6. In cases where manufacturers arrange for the reweighing and reinspecting of the rubber prior to taking delivery thereof, invoices for the charges, based upon not more than 80¢ per ton, should be rendered monthly and forwarded to the Buying Agent of Rubber Reserve Co. who delivered the rubber. After verifying the correctness of the charges, the Buying Agent will indicate his approval thereof and forward the invoice to Rubber Reserve Co. for payment.

### OPM Pronouncements

In the Division of Civilian Supply, Jesse L. Maury has been named chief of the Electrical Appliances and Consumers Durable Goods Branch.

In the Materials Division, appointed chief of the synthetic rubber unit of the chemical branch was Frank H. Carman.

Boyd E. Bridgwater, vice president of the Bridgwater Machine Co., Akron, O., has been named to the small business committee designed to spread defense contracts through thousands of small factories throughout the country.

#### Priorities Regulations

Following announcement of a nation-wide survey of compliance with priority regulations, Donald M. Nelson, director of priorities, on September 28 issued a statement on the working of the system, stressing the following points: "(1). There will be increased emphasis on allocation of materials and classification of end uses. (2). The priorities instruments used now will continue to be used as parts of the system. (3). Changes made will be worked out gradually, over a period of time. (4). All existing regulations and orders and certificates must be scrupulously obeyed, and violators will be held to account, punitive action being used if necessary."

On September 18, Mr. Nelson signed an order, in recognition of the increasing needs of camelback manufacturers for crude rubber, increasing the allocation of crude for camelback. Thus nearly all camelback manufacturers will receive additional supplies until December 31 when the order expires.

Mr. Nelson has issued an interpretation clearing up a contradiction between the terms of General Preference Order M-11, which decrees the manner in which producers must ship to customers, and the paragraph in Priorities Division Regulation No. 1, which made mandatory the acceptance of all defense orders. Thus under the zinc order a producer, after setting aside the amount stipulated for the zinc pool, must ship to each customer a pro-rata amount of his commitments to them; but if, after making delivery to one customer, the producer were required to accept a defense order, it might make impossible compliance with this requirement. To this extent, therefore, Regulation No. 1 does not apply to producers of zinc.

Producers of zinc, zinc oxide, and zinc dust from secondary materials, under toll agreements, are exempted from setting aside any of these materials for pool uses, in an amendment to General Preference Order M-11, announced October 16 by Priorities Director Nelson. Galvanizers who redistill zinc dross or skimmings for their own use are still subject to the pool requirements. The amendment also shifts from the processor to the owner of the materials, the obligation of setting aside a portion of zinc produced from primary materials under toll agreements.

Mr. Nelson also issued an interpretation, to supersede the statement of July 31, relating to the use of inventory materials to fill purchase orders bearing preference ratings, and limiting the circumstances under which preference ratings may be used by a supplier to obtain needed materials, as covered in the following three points: (1) A producer may not use a preference rating to procure materials for a defense order if his inventory is already large enough to permit his filling the order and still leave a practicable working minimum inventory. (2) If his inventory is below that minimum, he may use a preference rating to procure the needed materials if this use of the preference rating is authorized; he must not, however, delay the manufacture of the defense articles by awaiting the materials, but should proceed manufacturing immediately, using materials in his inventory. (3) If the producer fills the rated purchase order from materials on hand without extending the rating, he may not later extend the rating in order to obtain material to replenish his inventory.

Hundreds of thousands of the nation's industrial plants, big and small, were granted the use of an A-10 priority rating to obtain maintenance and repair materials, in line with the recently expressed policy of the Supply Priorities and Allocations Board of keeping the economy in good running order. The rating, granted by the Priorities Division of OPM, also can be used to obtain operating supplies (fuel, for example) used up in manufacturing. Retail establishments are excluded, at least for the time being, because of administrative difficulties inherent in operating a maintenance and repair plan in the field. But, generally speaking, the sweeping order extends priority assistance to many others in all segments of the American economy.

To conserve many materials needed for national defense, including rubber and neoprene, the Priorities Division recently ordered domestic mechanical refrigerator production for August through December cut 43.2% below average monthly factory sales in the year ended June 30, 1941.

All supplies of lead, including domestic lead and imported metal, were placed under full priority control by the Division on October 4. In 1939, the last prewar year, consumption of lead was divided as follows: storage batteries, 30%; white lead, 11%; cable covering, 11%; red lead, 9%; building, 8%; ammunition, 6%; foil and solder, 3% each; and miscellaneous uses, 19%.

An A-1-g preference rating was granted by Mr. Nelson on October 14 to manufacturers of power-driven industrial

lift trucks in securing certain essential supplies as: electrical accessories including batteries; and finished or semi-finished parts and accessories, including wheels and tires.

To offset the threat to the nation's food supply because of a shortage of certain chemicals used by farmers and food warehouses for fumigation purposes, Mr. Nelson, on October 15 placed under rigid control all stocks of chlorinated solvents. These are defined as: carbon tetrachloride, trichlorethylene, perchlorethylene, and ethylene dichloride. An emergency pool has been established for these solvents. Rubber processing and manufacturers are included among the uses for which the rating of B-2 is assigned.

#### Auto Output Cut Further

Leon Henderson, director of the Division of Civilian Supply, on October 15 decreed that automobile production in January, 1942, be reduced at least 51%, to a figure of 204,848 passenger cars, against 418,350 cars in January, 1941. The three large manufacturers were ordered to cut their January output 55.1% of the figure for January, 1941; while the six smaller companies may increase output 8% if sufficient materials are available. For the first six months of the 1942 model year (August-January) maximum output may not exceed 1,228,065, 36.3% under the 1,928,517 cars produced in the first six months of the 1941 model year.

Joseph W. Fraser, president of Willys-Overland Motors, Inc., Toledo, O., and a member of the OPM automobile advisory committee, on October 16 outlined before government officials in Washington a 14-point plan for automobile allotment which would release 454,-808,270 pounds of raw materials, including 26,378,879 pounds of rubber, for national defense needs and at the same time take care of civilian transportation needs. Basic features call for production of only the lightest weight car or series now being built by each parent manufacturer; allocation of production on the basis of critical material used, volume needed for successful operation, and the number of dealers dependent on a manufacturer; elimination of deluxe models and the production of only two- and four-door sedans; limiting of tires to the smallest size possible; elimination of non-functional accessories and rubber floor mats, spring shackles, body shims, and running board mats.

A one-month extension, to December 31, of the program to facilitate production of heavy motor trucks, medium trucks, and truck trailers was announced by Director Nelson on October 12. Thus during the period September 1—December 31 producers may manufacture two-thirds the number of medium motor trucks, truck trailers, and passenger carriers produced during the first half of 1941; but on all trucks for specific defense purposes there is no limit.

The OPM on October 23 reduced December output of light trucks (less than 1½ tons) for civilian use to 29%, or to 22,000 trucks, against 31,000 produced in December, 1940, to conserve material for heavier trucks for defense and essential civilian needs. Thus light truck output for the first five months of the 1942 model year cannot exceed 109,000 units, compared with 127,000 in the same period of 1940. It is believed production for the entire new model year will be set at 261,000 trucks, or about 30% under the 370,000 units of the 1941 model year.

### Entire Rubber Compound Is Rubber Tax Basis

The 10% manufacturers' excise tax on rubber products which went into effect on October 1, is referred to in the Revenue Act for 1941 as follows: "Articles of which rubber is the component material of chief weight, 10 per centum. The tax imposed under this paragraph shall not be applicable to footwear, articles designed especially for hospital or surgical use, or articles taxable under any other provision of this chapter." (Subsection 7 of Section 3406 of H.R. 5417).

While final interpretations of the tax are not available at this writing, it is understood that under a recent ruling by the Bureau of Internal Revenue, "rubber component" of a rubber article is defined as "the entire rubber compound", which includes, as well as crude rubber, all reclaim, fillers, chemicals, etc. A compound made solely with synthetic rubber is not taxable, the Bureau has also ruled.

**Federal Trade Commission,** Washington, D. C., recently completed a survey, for 1939, of 723 important corporations in 76 industries to determine operating ratios. The following statistics relate to the rubber industry. On the basis of data for five corporations the following summary of operating ratios or cents per dollar of sales was reported: material, 35.07, labor, 17.04, depreciation, 3.15, other costs, 9.77, sales expense, 15.11, advertising, 3.12, administrative and general, 2.33, total taxes except income and social security payments, 4.13, total social security payments, 1.03, research and development, 1.01, provision for uncollectible accounts, 0.56, (total, 92.32), other operating revenue or loss, 0.13, and net profit from manufacturing, extracting, and trading, 7.81. For six corporations the rate of return on the stockholders' average investment after deducting interest on long-term debt and all income taxes was almost 10%, and the same figure was reached as the return on the average total investment before long-term debt interest and income taxes.

**The Firestone Cotton Mills,** Gastonia, N. C., recently set a new safety record in the textile industry, when its employes worked 9,217,145 hours without a single lost-time accident, exceeding the previous record high by 2,400,000 hours. On behalf of the company and its employes General Manager Harold Mercer received a bronze plaque in recognition of this performance from the Liberty Mutual Insurance Co.

### OPA on Price Rises

The Office of Price Administration through Administrator Leon Henderson on October 5 stated that no justification exists for further increases in scrap rubber prices. This decision followed a conference with a representative group of wholesale dealers.

Then on October 11, Mr. Henderson told tire manufacturers he did not object to a rise in consumer list prices provided it did not exceed 9% of the level for tires and tubes on June 16. Mr. Henderson had previously sanctioned an increase of 2.4% above the same level, but approved the higher rate because of greater costs of raw materials and labor. Manufacturers, however, must first clear their new schedule of list prices with the OPM before issuing them.

The advance in consumer list prices will increase average wholesale prices received by manufacturers from 11½ to 13½%, depending upon the discount schedule of the manufacturer. These latter figures include advances of 5% in wholesale prices approved by OPA late in July.

Manufacturers will be required to maintain all discounts in effect June 16, unless changes are approved by OPA. Federal excise taxes will be shown as separate additions to list prices.

### Army Repair Facilities

Army supply plans, announced by the War Department, called for the opening October 1 of approximately 75 stationary shoe repair shops to expand the service provided by 26 clothing and equipage repair shops, each including a shoe repair section, operated for the Army by the Quartermaster Corps. The shoe shops, to be operated with civilian personnel from lists of the Civil Service Commission, will be equipped to handle both leather and rubber footwear.

No shoes or boots will be repaired which cannot be returned to the original wearer, and unless conditions warrant shoes will not be resoled the third time. All officers have been directed to instruct their men to turn in their shoes for repair as soon as they need attention to assure maximum use with a minimum of repair expense.

The War Department also announced that the motorization of the Army has necessitated erection of mechanical repair shops, 480 by 520 feet, at strategic points in each of the nine Army Corps Areas to house machinery and personnel for repairing and reconditioning motor vehicles. Besides there are seven supply depots likewise at strategic points and well stocked with spare parts.

**The Trenton (N. J.) Community Chest** now includes the following new members: Frederick E. Schluter, president, Thermoid Co.; Bruce Bedford, president, Luzerne Rubber Co.; and C. Edward Murray, Jr., vice president, Crescent Insulated Wire & Cable Co.

# EASTERN AND SOUTHERN

## U. S. Rubber Developments

United States Rubber Co., 1230 Sixth Ave., New York, N. Y., has developed a non-metallic material designed to replace aluminum in many defense uses. The new substance, known as Formula C-102, made from fibrous and rubber-like materials, most of which have so far escaped priorities, has been tested and approved by the United States Army. It is expected that the material will find also many applications in normal industry, as the replacement of aluminum panels in bus and truck body construction.

Discovered while members of the research department were working on bullet-puncture-sealing fuel tanks, the new product is said to surpass aluminum in many respects. Under gunfire, for example, it resists ripping or shattering. It likewise permits penetration of gunfire with little tearing and with maximum support to the sealing compounds used. It will not crystallize from vibration, as do metallic substances, and it is also claimed to be free of pinhole formation and corrosion. Formula C-102 is slightly thicker than 1/8-inch aluminum sheets as used in the fuel tanks, but is one-third lighter than aluminum.

W. H. Cobb, general manager of the mechanical goods division at Passaic, N. J., has announced mass production of airplane fuel hose that is said to swallow bullets one-half its own diameter. Already a half-million feet of the self-sealing material has been delivered for use by the Army and Navy. The hose is made virtually self-sealing by the action of a special rubber sealant placed between supporting plies of braided yarn. Both the interior tubing and the outside cover of the hose are of synthetic rubber with the exterior material having special electrical-conducting properties to dissipate static. The hose was developed to complement the bullet-hole sealing gas tanks now in large-scale production by U. S. Rubber at four of its plants.

U. S. Rubber last month delivered its first barrage balloon to the Army Air Corps. Shipped from the company's experimental plant at Naugatuck, Conn., it will be followed by a second now being made there, but then production will be transferred to the Woonsocket, R. I. plant, which has been reopened and reequipped for defense output exclusively.

Eric Burkman, secretary of U. S. Rubber, recently presented F. L. Lewton, director of the Crafts and Arts Division of the Smithsonian Institution, with the last white sidewall tire made at the company's Detroit factory. Molded into the sidewall is a reproduction of the OPM order prohibiting further manufacture of white sidewall tires.

Dispersions Process, Inc., and Naugatuck Chemical Division of U. S. Rubber once more[1] have issued an attractive four-page folder giving essential precautions to take for shipping liquid latex, Latol, and Dispersite during cold weather.

[1]See India Rubber World, Jan. 1, 1941, p. 38 for directions issued last year, which are about the same, except for a few minor changes.

## New Reclaim Plant Scheduled

David Schrage, 1650 Broadway, New York, N. Y., informs us that he intends to start operating a new reclaiming plant in the East which will be ready in January, 1942. According to Mr. Schrage, initial production is expected to be a minimum of 10 tons daily, with the view to expanding production facilities later. Further details regarding the new plant, which will utilize the alkali process, will be announced later. Mr. Schrage, formerly a rubber manufacturer in Poland, Lithuania, and Latvia, is now operating a rubber manufacturing plant in Cuba. (See page 183).

## NAITD Convention

The National Association of Independent Tire Dealers, Chicago, Ill., held its twenty-first annual meeting October 16, 17, 18 at Louisville, Ky., at which Wm. H. Hickey, of Hartford, Conn., was elected president, Dean Zook, of Pueblo, Colo., vice president, and C. C. Simpson, executive director.

Several resolutions were submitted by the Association committee, including: tire manufacturers drop fourth and fifth lines of tires, and, if necessary, third lines, in the interest of rubber conservation; the spare tire on original equipment be discontinued; a set of standards be set covering treading shop procedure and workmanship; plans be formulated to enable the independent commercial treaders to secure government treading and repair business; efforts be made to have the Tariff Commission request government aid for expanding commerial treading plants, in keeping with other recommendations this committee made in a recent report on rubber conservation.

Attending the convention were Ben Lewis and F. C. Phillips, of the Office of Price Administration, Washington, D. C.

An interesting feature of the convention was the exhibit of equipment manufacturers. Exhibitors also included Norwalk Tire & Rubber Co., Norwalk, Conn., and Polson Rubber Co., Garrettsville, O.

**Barber Asphalt Corp.,** Philadelphia, Pa., at a board meeting September 30 accepted the resignation of J. E. Auten as president and a director and then elected Vice President Frank Seamans to both vacancies. Secretary E. R Riter was made a vice president and will fill the two offices. At the same time T. Rieber was named a director to succeed the late Charles H. Schlacks.

## Koroseal to Be Rationed

Joseph A. Kaplan, president of Comprehensive Fabrics, Inc., Empire State Bldg., New York, N. Y., distributer of The B. F. Goodrich Co. synthetic to licensed firms, on October 11 announced a rationing system designed to guarantee widest possible distribution of amounts of Koroseal-treated fabrics which were on hand prior to the recent government order putting Koroseal production under mandatory priorities. Rationing, effective at once, will be on the basis of sales during the past year and will remain in force until the new Koroseal factory being constructed at Louisville, Ky., increases production beyond essential defense needs. Koroseal output at the plants at Niagara Falls, N. Y., and Akron, O., has also been upped.

Comprehensive Fabrics had on hand enough Koroseal-treated fabrics to meet about one-third of the 1940 consumer production when the government took over all available production to insulate wires and cables for gun control and electric power systems. If additional quantities become available because of possible changes in government requirements, these supplies will be added to the ration pool.

Companies affected by the rationing of Koroseal include: Harris Raincoat Co.; Joseph A. Kaplan, shower curtains; Kerk Guild, closet accessories; Haas-Jordan, umbrellas; Warren Featherbone Co. and Kennedy Car Liner & Bag Co., notions and novelties; and Hartmann Luggage Co.

**Nelson A. Rockefeller,** Coordinator of Inter-American Affairs, named Earl N. Bressman as director of the newly established Division of Agriculture in the Coordinator's Office on September 27. Dr. Bressman was formerly assistant director of the Office of Foreign Agricultural Relations of the United States Department of Agriculture. The primary objective of the new division is the establishment and operation of the proposed Institute of Tropical Agriculture, long advocated by Vice President Henry A. Wallace.

**Taylor Instrument Cos.,** Rochester, N. Y., recently appointed Wallace W. Lockwood advertising manager to succeed Elmer E. Way, resigned. Mr. Lockwood, who joined Taylor in 1932, was made assistant advertising manager in 1939.

**Clark Rubber Co.,** Trenton, N. J., has announced production of a new non-skid belting.

**Globe Woven Belting Co., Inc.,** 1396-98 Clinton St., Buffalo, N. Y., recently completed a building 175 by 75 feet to house the expanded endless woven rubber high-speed belting department. This expansion was necessitated by the greatly increased demands of the machine tool industry where these belts are employed because of the high speeds.

**Rubber Trade Association of New York, Inc.,** according to Secretary B. G. Davy, on October 11 moved from 95 Broad St., New York, N. Y., to Room 1100, 15 William St. (Telephone Whitehall 2-1275.) D. D. Haldane, distributing agent for the Rubber Reserve Co., Washington, D. C., also will make his headquarters at the William St. address

### Chemical Show Due December 1 To Feature Many New Products

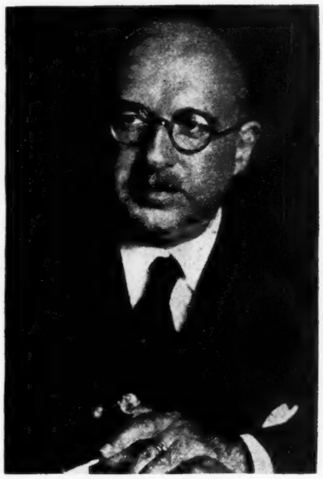
The Eighteenth Exposition of Chemical Industries, to be held in Grand Central Palace, New York, N. Y., the week of December 1 will have as its keynote technical problems created by the program of national defense. The more than 300 exhibits covering more than three acres of floor space promise to make this the largest exposition in 12 years. This array of chemicals, chemical products, laboratory equipment, processing machinery, apparatus, instruments, and materials will represent the latest creative ideas and the newest in creative applications and should attract a vast audience of chemists, chemical engineers, technologists, operating men, plant executives, and their associates.

Many new products will be unveiled, including: an instrument for continuous pH measurement; plastograph for recording consistency; an instrument which heats material under test, measures viscosity, and furnishes a record-keeping chart; a combination drying oven and analytical balance; a mass spectrometer; an illuminated shop microscope with an engraved scale reading directly to thousandths of an inch; a "clariflocculator" which combines the steps of flocculation and sedimentation; a squeegee type of pump utilizing a tube of rubber or synthetic material; a hard rubber filter; rubber coatings for the rotors and housing of fans to replace Monel and stainless steel parts; hydraulic automatic control for variable speed transmissions; a Pliofilm packaging machine; a new series of automatic scales; fiber shipping drums to replace steel; and a two-way telephone gas mask.

Other exhibitors will include specialists in industrial development work, who will offer such completely integrated facilities as: acid plants, extraction plants, machinery for turning out various products in plastic materials, and molding powders. Conferences and consultations between leaders in science and industry and discussions and demonstrations of new problems or new solutions of old problems will be available.

This exposition, like its predecessors, held biennially, will be under the management of the International Exposition Co., of which Charles F. Roth is president and manager. E. K. Stevens is associate manager of the show; while M. C. Whitaker, vice president of the American Cyanamid Co., 30 Rockefeller Plaza, New York, is again chairman of the advisory committee.

The Exposition will be open to qualified visitors by invitation and registration.



**Hugo Fuchs**

### Technical Adviser

Hugo Fuchs after a long and varied experience abroad is now in this country. He was born in Prague on October 2, 1883. His schooling was intensive. From 1890 to 1897 he attended high school and the next year matriculated at the Institute of Technology at the University of Prague. He was graduated in 1906, having passed all examinations with honors. Then in 1910 he was awarded the degree of doctor of technical sciences. In 1912, 1913, and 1914, Dr. Fuchs won a scholarship that enabled him to spend several months in Germany (Materialprüfungsamt, Grosslichterfelde, and the Deutsche Kahneisengesellschaft) and then at Columbia University, New York, as a guest student (1914).

Meanwhile, in 1908 he had been appointed as assistant at the Institute of Technology (Department of Roads and Railways) and at the same time became secretary of the International Institute of Techno-Bibliography and assistant editor of the technical and economics magazine *Rundschau für Technik und Wirtschaft.* Then in 1911, Dr. Fuchs had been named a professor at the Technical College in Pilsen, Czechoslovakia, which post he held until 1921. During the same years, except for 1915 to 1918, when he was a commissioned officer in an *"Eisenbahn"* (railroad) regiment in the World War, he had served as industrial and technical adviser of the Anglo-Austrian Bank, followed by five years as industrial adviser and director of the Bohemian Commercial Bank in Prague. From 1920 until 1926 he had also been an assistant professor at the Institute of Technology at his Alma Mater.

The next year Dr. Fuchs was made a director, then managing director and a member of the board of the "Semperit" Austro-American Rubber Works in Vienna. He was moreover, a counselor of trade of the Austrian Government. Following the invasion of Austria, however, he returned to Prague in 1938 as assistant editor of the Czech Government's weekly, *Ost-europäischer Volkswirt* (*East European Economist*). But in 1939, Dr. Fuchs went to London, England, where he remained until June, 1941. There he was engaged as technical adviser of "Reliance" Rubber Co., Ltd., and also contributed technical and economics articles to the *Rubber Age* (London).

### Foam Rubber Cushions Seen at Furniture Show

The gradual replacement of padded upholstery by foam rubber cushioning in easy chairs was demonstrated at the Museum of Modern Art, 11 W. 53rd St., New York, N. Y., from September 24 to November 9, as part of the inter-American design competition in furniture and furnishings. The exhibits included cross-sections of chairs illustrating the molded plywood construction and the latex cushions and photographs showing steps in the construction of the chairs. In some chairs the foam rubber padding was welded to the plywood by a process said to require moderate pressures and a temperature of 300° F.; in most chairs, however, latex cushions were merely placed on steel springs which stretched across the seat. One of the plywood-latex cushion chairs weighs about 20 pounds in contrast to the upholstered chairs which weigh approximately 45 pounds each. Some of the chairs were designed by Saarinen and Eames, and others were designed by Nicholson and Maier. There were also sofas and occasional chairs using molded latex cushions of two-inch thickness; these were constructed of maple rather than plywood.

**Brake Lining Manufacturers' Association, Inc.,** 370 Lexington Ave., New York, N. Y., on September 24 held its annual meeting at which the following officers were elected: president, R. B. Davis, Raybestos Division of Raybestos-Manhattan, Inc.; first vice president, T. L. Gatke, Gatke Corp.; second vice president, P. B. Hoffman, American Brakeblok Division of American Brake Shoe & Foundry Co.; treasurer, J. S. Doyle, Johns-Mansville Corp.; secretary and assistant treasurer, H. G. Duschek; executive committee, Messrs. Davis, Gatke, Hoffman, and Doyle, W. E. Harvey, Thermoid Co., G. M. Williams, Russell Mfg. Co., M. M. Monroe, Inland Mfg. Division of General Motors Corp., J. W. Crawford, Firestone Tire & Rubber Co., and F. I. Marshall, Marshall-Eclipse Division of Bendix Aviation Corp.

**General Electric Co.,** Schenectady, N. Y., according to President Charles E. Wilson, received orders during the first nine months this year that totaled the record high of $831,390,000, 109% higher than the $397,810,000 for the corresponding period of 1940. During the third quarter of 1941 orders amounted to a record of $310,251,000, against $185,157,000 for the same quarter last year. Defense orders constitute a large share of the business.

**Donald W. Hoover**

**Revertex Corp. of America.**, 37-08 Northern Blvd., Long Island City, N. Y., has appointed Donald W. Hoover its representative in the Midwest, with permanent headquarters in Chicago, Ill., at the Monadnock Bldg., 53 W. Jackson Blvd. (Telephone Wabash 5388). Mr. Hoover for the past year has been doing technical sales work from the main office in Long Island City. Prior to his connection with Revertex, Mr. Hoover was for 7½ years employed by the United States Rubber Co. at its Providence, R. I., plant and was in charge of latex sundries and metal coating production. He received his technical education at the University of Alabama.

**Essex Rubber Co.**, Trenton, N. J., announces a better demand for various kinds of sundries. The strike of the 450 employes, which lasted two weeks, was settled after the concern signed a contract agreeing to an increase in pay, shorter working hours, and better working conditions.

**William M. Morse**, editor emeritus of INDIA RUBBER WORLD, who visited this office last month on his way to Florida for the winter, wishes to be remembered to the trade.

**Nearpara Rubber Co.**, Trenton, N. J., is operating to capacity. President Benjamin Rosenthal reports increased demand for reclaimed rubber.

**Rubber & Plastics Compounds Co., Inc.**, 157 Chambers St., New York, N. Y., through General Manager A. Treves has announced that Oscar and Henry Ghez are now associated with the company. Drs. Ghez, former presiding officers and general managers, of Industrie du Caoutchouc Souple, manufacturer of rubber goods at Pont-de-Cherny, France, and former owners of the Sigma reclaiming factories of Rome, Italy, while abroad developed several new reclaiming processes and uses of reclaim, particularly in footwear, and will continue, while here, their research in the field of reclaimed rubber.

**W. L. Finger,** formerly with the OPM, has rejoined The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y.

**L. Albert & Son,** rubber machinery dealer, Trenton, N. J., had added to its staff J. W. Devine, formerly with John Royle & Sons, Trenton. Vice President Philip E. Albert has returned from a lengthy business trip to the Pacific Coast.

**Foster D. Snell, Inc.**, 304 Washington St., Brooklyn, N. Y., has granted a leave of absence to Theodore M. Miller, in charge of the consumer testing department, to allow him to work with the Office of Price Administration. Dr. Snell was elected president of the Columbia Graduate Alumni for 1941-1942.

**Edmund S. Burke,** president, Kelly-Springfield Tire Co., Cumberland, Md., recently addressed the local Lions Club and declared that although the supply of tires for civilian use is being reduced, it will prove adequate if motorists take proper care of their tires. The allocation of rubber, which has resulted in curtailed production, has led to a 15 to 20% cut in the number of workers at Kelly-Springfield.

**Toy Manufacturers of the U. S. A.** held its twenty-fifth annual convention recently at the Waldorf-Astoria Hotel, New York, N. Y., at which T. W. Smith, Jr., secretary-treasurer and general manager of Sun Rubber Co., Barberton, O., was elected president, and Ben F. Michtom, vice president of Ideal Rubber Co., Inc., Brooklyn, N. Y., was chosen a director.

**Industrial Maintenance Association,** Central New Jersey Electrical League, held a meeting September 19 at the Whitehead Bros. Rubber Co., Trenton, N. J., to discuss "Thermo-Plastics, Their Uses and Manufacture." Speakers included C. P. Morgan and R. W. Lesters, chief chemist and maintenance engineer, respectively, of the Vulcanized Rubber Co., Morrisville, Pa., and Charles C. Davis, assistant factory manager, Joseph Stokes Rubber Co., Trenton. A motion picture, "It's up to Us—Gas and Rubber Economy", was shown by General Motors Corp., Detroit, Mich. At a meeting of the League set for October 17 to consider synthetic products, scheduled speakers were Joseph Crosby, sales manager, Thiokol Corp., Trenton, and V. A. Cosler, manager, Neoprene Sales Promotion, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

**Martindell Molding Co.,** Trenton, N. J., now operates 24 hours a day on a five-day schedule after having installed additional machinery in a new addition.

**The New York Aquarium,** under process of dismantling last month, had a large number of employes remove thousands of feet of hard rubber pipe which comprised the circulating water system.

## Defense Exposition

A number of rubber applications in the national defense program were seen at the Civilian and National Defense Exposition in Grand Central Palace, New York, N. Y., September 20 to October 18. Proceeds were divided between the United Service Organizations and the Civilian Defense Uniform Committee.

Exhibits of interest to the rubber trade included rubberized wading suits used by the men who attach landing apparatus to flying boats, firefighting equipment, and the respirators of the Department of Police, New York. Rubber was used in the various types of gas masks displayed. Stirrup pumps for extinguishing incendiary bombs utilized long heavy rubber hoses. The bulkiest rubber object on display was a Douglas B-19 airplane tire, weighing 961 pounds, standing 7½ feet high, and containing 124 miles of cotton cord.

At the Office of Production Management National Defense Clinic, held jointly with the Exposition, 125 prime contractors—manufacturers of tanks, airplanes, guns, etc.—opened negotiations which are expected eventually to develop into contracts with 2,661 smaller firms —manufacturers of toys, printing presses, dental supplies, etc. There was a representation of 4,600 sub-contractors from 26 states, and the interviews arranged among representatives of small firms, prime contractors, and government totaled 25,000.

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**National Automotive Fibres Corp.,** Trenton, N. J., has appointed as development engineer Henry Minor, formerly with the Dayton Rubber Mfg. Co., Dayton, O., the United States Rubber Co., Detroit, Mich.

**Commodity Exchange, Inc.,** 81 Broad St., New York, N. Y., on October 8 named Henry J. Fink, formerly assistant secretary, secretary of the Exchange to succeed Walter Dutton, retired.

**James P. Flynn,** factory manager of the Puritan Rubber Co., Trenton, N. J., has returned from a business trip through Pennsylvania.

**Polytechnic Institute of Brooklyn,** Brooklyn, N. Y., under its Department of Chemistry is conducting on alternate Saturdays, from 11:00 a.m. to 1:00 p.m., beginning October 18, a series of seminar meetings on "Elasticity and Plasticity" under the leadership of Prof. Hermann Mark, Prof. Wm. H. Gardner, and Dr. Robert Simha. The seminar will discuss from a fundamental point of view the mechanical properties of deformable materials, ideal elastic solids, Newtonian liquids, and complex plasto-elastic systems, with particular emphasis on their molecular structures. All interested chemists are invited to attend and participate in the discussions. Dr. Simha, a Laylor Fellow at Columbia University, recently became associated with Dr. Mark in his work on high polymers and will also instruct in the Evening School.

# MIDWEST

**L. J. White Co.,** manufacturer of industrial cleaning compounds, 315 W. Hubbard St., Chicago, Ill., according to President W. G. Nuelsen, has changed its name to Kelite Products, Inc., in order to identify more closely the scope and function of the organization.

**The Federal Reserve Bank** of Chicago, Ill., recently reported a 27% rise in factory employment in the United States between July, 1940, and July, 1941, with a 33% gain in rubber products employes, although employment in the rubber boots and shoes group was up between 45 to 55%. Thirty-five rubber firms in the Midwest in August paid 24,797 workers $877,000 in wages, gains of 2.1 and 6.2%, respectively, over the previous month.

**Schacht Rubber Co., Inc.,** Firestone subsidiary manufacturing mechanical rubber goods in Noblesville, Ind., according to Vice President John K. Mason, plans an addition to its present plant to increase capacity about one-third, or 30,000 square feet.

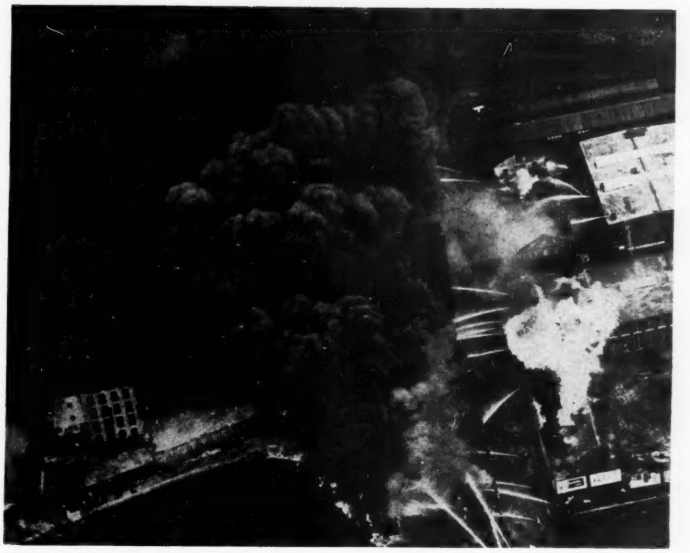
**United Rubber Workers' Union** recently held its annual national convention at the Hotel Severin, Indianapolis, Ind., at which the following officers were elected: president, Stanley Dalrymple, the union's head since its formation six years ago; vice president, L. S. Buckmaster; secretary-treasurer, Frank Grillo, reelected; executive board, Wm. Abel, H. H. Wilson, Fleet Perrine, T. F. Burns, W. J. Welch, George Cummins, W. I. Vaught, and Joseph Sebald. Akron was selected for next year's convention.

# NEW ENGLAND

**United Shoe Machinery Corp.,** 140 Federal St., Boston, Mass., has appointed Joseph F. Wogan general manager to succeed the late Harold A. Osborne. Mr. Wogan joined the corporation in 1904 and won many promotions and was made assistant general manager in 1928.

**Delco Rubber Co.,** Worcester, Mass., has named as president and treasurer Frank W. DeLuca, former head of the Empire Rubber Corp., also of Worcester.

**The Rhode Island rubber manufacturing industry** in September employed 4,818 workers, compared with 4,722 in August and 3,646 in September, 1940; while payroll disbursements for the respective months were: $490,000, $444,000, and $289,000. The industry consumed 2,959,000 kilowatt hours of power in September, against 2,815,000 in August and 1,964,000 in September last year.



*International News Photo*

**Aerial View of the Firestone Fire**

## $17,000,000 Inferno at Fall River Destroys 15,850 Tons of Defense Rubber

The Rubber Reserve Co. lost 15,850 tons of crude rubber in a fire which severely damaged the plant of the Firestone Rubber & Latex Products Co. at Fall River, Mass., on October 11 and 12. Only 2,000 tons out of a total of 17,850 tons of government rubber, all fully insured, which were stored in the plant were not destroyed. In addition to the government rubber, about 2,000 tons of Firestone rubber were believed to have been destroyed. It was also estimated that more than $3,000,000 worth of machinery was lost. Four of the firm's eight buildings were gutted by fire. Two of the buildings destroyed were used as warehouses; while the other two were for manufacture. About 1,000 men were working in the plant when the fire broke out, but all reached safety. The total damage, including rubber, was estimated at $17,000,000, but it was reported that the entire plant and its contents were covered by insurance. As a result of the fire, 2,000 of 3,200 employes were temporarily without work.

The fire broke out at 11 p.m., October 11 on the third floor of Plant No. 5, a five-story structure containing the firm's foamed latex department. Workmen reported that one of the curing ovens for rubber automobile cushions, which was heated by low-pressure steam, flared and spread to the other ovens and the floor before the flames could be extinguished. Fanned by a high wind, the flames soon leaped to other buildings and finally to the large stone building, six stories high and 600 feet long, which housed the government rubber. The fire destroyed several other buildings in the neighborhood and near dawn of October 12 threatened to spread to a half-dozen more mills, a large gas tank, and a plant where 1,800,000 gallons of gasoline and kerosene were stored. This danger was averted by a sudden shift in the wind. Hundreds of firemen from a number of communities in both Massachusetts and Rhode Island fought the flames which raged 14 hours. For nearly a week, however, rubber smoldered before it was completely extinguished. Although several firemen were taken to hospitals, no fatalities resulted from the blaze.

The buildings occupied by Firestone were formerly the mills of the American Print Works, once one of the world's largest cotton textile mills. The property in Fall River was acquired by Firestone in 1936.

Work on defense projects was resumed two days after the fire.

### Rhode Island Rubber Club Elects New Officers

L. K. Youce, (Firestone Rubber & Latex) and L. K. Morrow, (Anaconda Wire & Cable) were elected president and secretary-treasurer, respectively, of the Rhode Island Rubber Club at a meeting at the Metacomet Golf Club, East Providence, R. I., September 26. The following were elected to the executive committee: F. Springer (Davol); S. J. Lake (Respro); H. E. Murch (Goodyear Footwear); D. Rhee (Carr Mfg.); H. A. Schlosser (American Wringer); J. H. Christopher (Titanium Pigments); A. R. Nichols (U. S. Rubber); and J. Marshall, Jr. (Collyer Insulated Wire). The nominating committee was headed by E. L. Hanna (Davol) and included C. Haynes (Binney & Smith) and F. R. Fitzpatrick (Respro).

Of the 81 people who attended dinner, 36 played golf. Following are the golf

scores: *low gross,* D. Gifford, 80, and E. Colligan, 83; *low net,* F. Jacoby (Ernest Jacoby & Co.) 70, and S. Tinsley (Vanderbilt), 70; *blind bogey,* J. Breckley (Titanium) and M. T. Mason. The dinner guests were entertained by a magician, Harry Scheer.

**Godfrey L. Cabot, Inc.,** 77 Franklin St., Boston, Mass., has established a research fellowship at Johns Hopkins University for the academic year 1941-1942 for further study of surface area measurements by adsorption techniques. The program is under the direction of Prof. P. H. Emmett.

# OHIO

## Firestone Activities

**The Firestone Tire & Rubber Co.,** Akron, is said to be the first in the industry to utilize tire-making equipment and methods to step up output of an improved bullet-sealing fuel tank for airplanes. By fabricating tank parts along its regular tire production lines and by introducing the use of curing molds for the first time, Firestone is eliminating three days of drying time, necessary under the former method, and guaranteeing a permanent sealing of all parts of the tanks to withstand the heaviest machine gun fire.

The first meeting of the reorganized southern zone was held recently at the Firestone Tire & Rubber Co., Memphis, Tenn. Among those attending were Raymond C. Firestone, president of the Tennessee company, and J. E. Davis, manager of the southern division.

### Hevea Seeds from Liberia Sent to Brazil

On October 24 the Firestone company shipped from New York, N. Y., to Brazil more than a million seeds of *Hevea Brasiliensis* from the Firestone plantations in Liberia, West Africa. These seeds, part of shipments totaling more than two million seeds destined for many of the rubber experimental stations established in Latin America under the auspices of the United States Government, are from crosses of certain clones bred by Firestone in Liberia, where the rubber trees are free of leaf disease, which has proved an obstacle in the reestablishment of large-scale commercial rubber production in Latin America.

Participating in the ceremony and luncheon marking the affair were Harvey S. Firestone, Jr., vice president of the Akron concern and chief executive of Firestone Plantations Co., who presented the shipment to E. W. Brandes, of the Bureau of Plant Industry of the U. S. Department of Agriculture; T. D. Mallery, also of the Department of Agriculture; and Don Glassman, of the Office of Coordinator for Inter-American Relations.

## Goodyear Changes

Fred W. Climer, personnel director, Goodyear Tire & Rubber Co., Akron, last month announced the following changes in the personnel division. R. Harold Meiser, for seven years manager of personnel efficiency, has been made personnel manager of the Goodyear factory at Sydney, Australia, and has been succeeded in Akron by Sherman Burgess, manager of the Plant 2 labor department. Temporarily in Mr. Burgess's former post is R. D. Wilson. Manager of plant efficiency is Nelson G. Ball, who succeeded E. R. Gilleland when he was appointed production superintendent of Goodyear Aircraft Corp., Litchfield, Ariz.

C. K. Ellsworth, manager of the merchandise-container division of Pliofilm Sales Dept. for Goodyear since September, 1940, has been named to the staff in Sales Promotion, succeeding E. B. Brewster, resigned.

Jesse Jones, Federal Loan Administrator, on October 8 announced that Defense Plant Corp., RFC subsidiary, Washington, D. C., has authorized the execution of a lease agreement with the Goodyear Aircraft Corp., Akron, to provide for the acquisition of machinery and equipment for plant at Litchfield Park, Ariz., at a cost of $499,889. These facilities will be used in the manufacture of aircraft equipment. The Navy Department requested the facilities, and title will remain in Defense Plant Corp. This commitment will be in addition to a previous authorization of $3,642,280 for plant at Akron, to be used in the manufacture of aircraft equipment.

### New Type of Pliofilm

A new type of Pliofilm, more cloth-like in texture and wearability and more rubber-like in softness and durability than previous types, is announced by Goodyear for use as rainwear fabric. Special plasticizers of extremely low volatility, used in the manufacture of the new Pliofilm, are claimed to minimize internal friction of the molecules. Reportedly possessing greater strength under shock impact, the new material is said to stand elongation at a high rate of loading. Claimed to be free of "rustle", it is being introduced by Richards, Boggs & King, Chicago, Ill., Pliofilm, fabricator and distributer.

**The University of Akron** has appointed La Verne E. Cheyney assistant professor of chemistry. He will conduct the courses in rubber chemistry formerly given by Howard I. Cramer, who resigned this summer to join Sharples Chemicals, Inc. Dr. Cheyney received his B.S. from Akron U., M.S. from the University of Pennsylvania, and Ph.D. from Ohio State University. He had been employed in the laboratory organizations of The B. F. Goodrich Co., Pittsburgh Plate Glass Co., The National Aniline & Chemical Co., Inc., and the Goodyear Tire & Rubber Co., where he was a research chemist three years.

## General Tire News

The General Tire & Rubber Co., Akron, according to L. A. McQueen, vice president in charge of sales, will continue throughout the fall the consistent newspaper advertising campaign begun last spring, which has proved so successful. Mr. McQueen stated that while the industry as a whole gained 13.6% in passenger-car four-ply replacement sales this year, his company reported a rise almost twice that; besides the gain in areas where the ad-carrying newspapers reached was more than double that of territories not so covered.

Mr. McQueen announced the appointment of Wm. H. Mason as director of public relations for the General Tire company. Mr. Mason has had a wide experience in the advertising and newspaper fields and for the past four years was in the Detroit office of *The New York Times.*

General A. L. Rodriguez, former president of Mexico and now an industrialist in Lower California as well as chief stockholder of Cia. Hulera El Popo, S.A., Mexico City, plant of the General Tire & Rubber Co., recently visited Akron where he was the guest of William O'Neil, General Tire president. General Rodriguez showed great interest in the defense work being done at the rubber company and declared Mexico is just as conscious of the need of defense production and of preparation against invasion as is the United States.

William O'Neil, General Tire president, was a speaker and participant in the ground-breaking ceremonies on October 17 that officially launched construction of the Mississippi Ordnance Plant, Flora, Miss., to be built and operated by the General Tire Engineering Co., Jackson, Miss., wholly owned subsidiary of the General Tire & Rubber Co. Mr. McQueen also was present.

**"General Tire", New Trade Mark Character of General Tire & Rubber Co.**

J. B. Barr

**The Charles Eneu Johnson Co.,** manufacturer of pigments since 1804, recently opened an office in the First Central Tower Bldg., Akron, exclusively for the sales of carbon black. Manager is J. B. Barr, for the past ten years sales manager of the carbon division of the Imperial Oil & Gas Products Co., Pittsburgh, Pa. The C. P. Hall Co., Akron, is sole distributer of Johnson's carbon black.

**The Swan Rubber Co.,** manufacturer of rubber and asbestos products, Bucyrus, according to President M. G. Nussbaum, is now in production in a new two-story daylight plant in connection with its previous buildings. The additional floor space of 15,000 square feet is devoted entirely to the manufacture of mechanical rubber goods.

## Goodrich Activities

A sponge rubber made from the synthetic rubber, Ameripol, by the use of sodium bicarbonate or a similar blowing agent was announced by The B. F. Goodrich Co., Akron. This product is in the same manufacturing classification as milled sponge made from natural rubber. The use of Ameripol in the manufacture of soles and heels, which are said to resist rubber solvents, abrasion, and flex cracking, was also reported.

In recognition of his 40 years with the Goodrich company, W. A. Whitenack, manager of the New York district mechanical sales division, received a diamond studded service pin at a testimonial dinner at the Hotel Lexington, New York, N. Y., September 19. A. L. Hupfer, president of the firm's employe service organization, and W. S. Richardson, sales manager of the Goodrich mechanical goods division, presided at the presentation ceremonies.

Guy Gundaker, Jr., who has been with Goodrich since 1924 and lately as manager of its budget sales and auto and home supplies departments, last month was made general manager of the store administration department, and Frank R. Stanford became operations manager.

## Rubber Improving Tractors

Robert Mayne and H. W. Delzell, Goodrich development engineers, in a paper presented at the recent S.A.E. national tractor meeting in Milwaukee, Wis., declared that the speed and mobility of thousands of combat units of the expanding United States mechanized army have been greatly increased by the use of rubber tracks on crawler tractors. Such tracks on army tanks, scout cars, and anti-aircraft and anti-tank gun carriers permit higher speeds, use of any type of highway without damaging it, and operation on any type of terrain. Other advantages are low rolling resistance, freedom of the crawler from noise and vibration, operation at high speeds, high efficiency and traction. It is also expected that lessons gained from use of rubber tracks on combat vehicles will prove most helpful in the adaptation of such equipment to commercial uses when the present emergency has passed.

**The Standard Chemical Co.,** Akron, has taken over, as of October 1, the manufacture and sale of the crayons formerly handled by the Crayon Dept., Monsanto Chemical Co., St. Louis, Mo.

**The Ohio Rubber Co.,** Willoughby, according to Plant Superintendent R. A. Mertz, within the next six months expects to devote 75% of its production facilities to defense needs and also anticipates a busy fall and winter. The company is converting its equipment from the manufacture of running boards and other automotive parts to rubber tracks for tanks and other defense items. About 1,300 workers are employed.

**The Faultless Rubber Co.,** Ashland, on October 6 elected the following officers: president, Wallace De Laney; executive vice president, C. D. Hubler; vice president, T. W. Miller, Jr.; secretary-treasurer, George A. Meiler; directors, the company officers, T. W. Miller, J. C. Myers, and Wm. A. McAfee.

# CANADA

**The Dominion Department of Munitions and Supply,** Ottawa, Ont., has appointed J. A. Martin, for many years an executive of the Dominion Rubber Co., Ltd., Montreal, P. Q., deputy controller of rubber, subject to Allan Williamson, controller of supplies in the Department.

The Department recently awarded the following contracts: *clothing*, Canadian General Rubber Co., Ltd., $71,979, Dominion Rubber Co., Ltd., $221,462, Kaufman Rubber Co., Ltd., $166,720; *land transport*, Dominion Rubber, $10,115, Goodyear Tire & Rubber Co. of Canada, Ltd., $327,648; *personal equipment*, Canadian General, $44,000; Dominion Rubber, $26,070, Kaufman, $48,750, Rubberset Co., Ltd., $15,836.

**B. F. Goodrich Co. of Canada, Ltd.,** Kitchener, Ont., recently elected G. W. Sawin, who was vice president and general manager for the past five years, as president to succeed John L. Collyer, now chairman of the board. Factory Manager B. M. Costello was made a vice president and a director.

J. G. Hagey, Goodrich advertising manager, on October 9 was a speaker at the twenty-fourth annual convention of the Direct Mail Advertising Association at Mount Royal Hotel, Montreal.

**Goodyear Tire & Rubber Co. of Canada, Ltd.,** New Toronto, Ont., recently, for the first time, was the scene of a conference attended by representatives of the world-wide Goodyear organization. Manufacturing problems arising out of war needs were discussed by production and development executives. President A. G. Partridge and Vice President E. H. Koken were among the speakers. Those present included the following factory superintendents: W. J. Condon, Sydney, Australia; E. T. Ruffner, Buitenzorg, Java; R. L. Patrick, Buenos Aires, Argentina; F. L. Carter, Sao Paulo, Brazil; H. G. Nizder, South Africa; as well as executives of the several Canadian and United States plants. A dinner was held in the Royal York Hotel, Toronto.

Mr. Partridge, in a recent letter to stockholders, reported that company sales for the first nine months of 1941 were substantially higher than in the corresponding period last year, that all three Canadian plants have been working to almost maximum capacity the current year, and that this large turnover has affected profits very satisfactorily even though an ever-increasing share of the business is for the government and taxes have been increased.

**Seiberling Rubber Co. of Canada, Ltd.,** recently officially opened its new $100,000 plant addition providing new offices and warehousing space on Paton Rd., Toronto, Ont. Participating in the ceremonies were J. Penfield Seiberling, president of the Seiberling Rubber Co., Akron, O., U. S. A., and the following Canadian executives: R. J. Thomas, president; Marcus L. Brown, vice president in charge of production; H. W. Gregory, vice president in charge of sales; P. G. Davies, secretary; and J. A. Thompson, director. Mr. Seiberling also addressed the Kiwanis Club of West Toronto.

**H. M. Hetherington,** secretary of the Viceroy Mfg. Co., Ltd., Toronto, and vice president of the Society of Industrial & Cost Accountants of Ontario, on October 18 addressed the first lecture meeting of the winter season of the Cost & Management Institute.

**George W. Huggett,** a director of Canadian Lastex, Ltd., Montreal, P. Q., and of Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., has been named president and managing director of Canadian Industries, Ltd., Montreal, to succeed the late Arthur B. Purvis.

# OBITUARY

### Samuel Norris

AFTER a long illness Samuel Norris, former executive of the United States Rubber Co., New York, N. Y., died on September 25 at his home in Ridgefield, Conn., where funeral services were conducted on September 28. Burial occurred in his birthplace, Bristol, R. I.

Mr. Norris, who was born July 23, 1862, received his early education abroad and later attended Harvard College (Class of 1883) and Harvard Law School (1885). He then practised law in Providence, R. I., but in July 1897, became an attorney for U. S. Rubber. In 1901 he was elected secretary also of the company, and later served, besides, as a director. He was secretary and general attorney when he retired April 23, 1929.

From 1897 until 1899 Mr. Norris was a member of the Rhode Island Legislature. He was a former president of the Pacific, Idaho & Northern Railroad and also belonged to many clubs.

He is survived by his wife.

### Joseph E. Stone

A FALL caused by a shock led to the death, on September 20, of Joseph Everett Stone, president and treasurer of Kleistone Rubber Co., Inc., Warren, R. I., since he helped organize it August 15, 1920. Private funeral services were held in Providence, R. I., September 23, with interment in Swampscott Cemetery, Swampscott, Mass.

The deceased was born January 31, 1876, in Marblehead, Mass., where he attended the public schools. While a boy, he began earning his own living and eventually secured employment with the Hood Rubber Co., Watertown, Mass. He remained there 14 years mostly as cashier and assistant treasurer. In 1913, however, Mr. Stone became treasurer and a director of the Plymouth Rubber Co., Canton, Mass., and continued as such until his association with the Kleistone concern, which became one of the pioneers in the manufacture of rubber floor tiling.

During his lifetime Mr. Stone belonged to many organizations, including the Rubber Association of America, the Boston Chamber of Commerce, the Boston City Club, the Rhode Island Rubber Club, the Providence Chamber of Commerce, and the Masons.

He leaves a wife, two sons, two daughters, a sister, and several grandchildren.

### Albert H. Hastorf

ALBERT H. HASTORF, for the past five years on the sales staff of Binney & Smith Co., 41 E. 42nd St., New York, N. Y., died suddenly on September 28 at his home in Westfield, N. J. He was born 49 years ago in New York, where he received his education. During the World War, Mr. Hastorf was a captain and later worked for a shipping concern.

Funeral services took place in Westfield on September 30.

### C. E. Foresman

AFTER a short illness Clarence E. Foresman, veteran employe of the United States Rubber Co., died at the Williamsport, Pa., Hospital on September 11. He began his rubber career as a clerk at Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn., on December 20, 1898. On November 1, 1919, Mr. Foresman became assistant superintendent of the Lycoming Rubber Co., footwear manufacturing subsidiary of U. S. Rubber at Williamsport, and on September 10, 1928, was made cashier and paymaster there. After the closing of the plant, on October 1, 1932, the deceased was named custodian of the idle property.

He was born in Williamsport, September 20, 1874, and attended the local elementary and high schools. During the Spanish American War, Mr. Foresman was a battalion sergeant-major, Twelfth Regiment, Pennsylvania Volunteer Infantry.

He belonged also to the Lycoming Historical Society, the Y.M.C.A., the Consolidated Sportsmen of Lycoming County, and the Pennsylvania National Guard.

Funeral services were held at his late residence in Williamsport on September 13.

Survivors include the widow, two brothers, and three sisters.

### Lee R. Miller

LEE R. MILLER, who developed the rubber glove and co-founded The Miller Rubber Co., Akron, O., in 1894, died on September 27 in Akron after a short illness. He was born in Smithville, O., November 27, 1876, and came to Akron as a young man to help organize the Miller company, which became a subsidiary of The B. F. Goodrich Co., Akron, in 1930. The deceased, who had been manager of the Miller glove department, continued as such under the Goodrich management.

Mr. Miller for twenty years was governor of Akron Lodge, Loyal Order of Moose, and very active in the national organization, and for seven years was treasurer of the Goodrich Twenty-Year Service Club.

Funeral services were held at Billow's Chapel, Akron, September 30. Burial occurred in Rose Hill Cemetery.

Survivors include his wife, a daughter, and a sister.

# FROM OUR COLUMNS

### 50 Years Ago—November, 1891

The caoutchouc produced in Dutch Guiana is "balata" or "milk of the bullet tree", and its export is attaining considerable proportions. As there is no forest conservation law in the colony, trees are being destroyed, and it is believed that the present rate of production will decline. (p. 38)

A process which combines leather scrap with India-rubber to form artificial leather is now used in England. (p. 43)

The use of asbestos in connection with India-rubber is now practiced in several directions. The compounds are used as packing for steam joints and washers. (p. 47)

The barter of goods for crude rubber on the coast of Ecuador, carried on by trading companies as an accessory to other branches of their business, is variable and intermittent. Ecuadoran rubber, of an inferior quality, is in lumps and flakes of the *Castilloa elastica* variety. (p. 48)

"Gutta-percha paper" is cited by Dr. Vasily P. Kurtchinsky as the best means of rapidly curing even the most intractable ulcers of the leg. (p. 53)

Rubber-covered steps are now replacing the old-fashioned iron carriage steps. Such steps of various designs are manufactured for buggies, beach wagons, goddards, phaetons, broughams, herdics, and cabs. (p. 56)

Well-shaped elastic finger tips, made of fine Pará, are used in hospitals for sore fingers and thumbs. (p. 57)

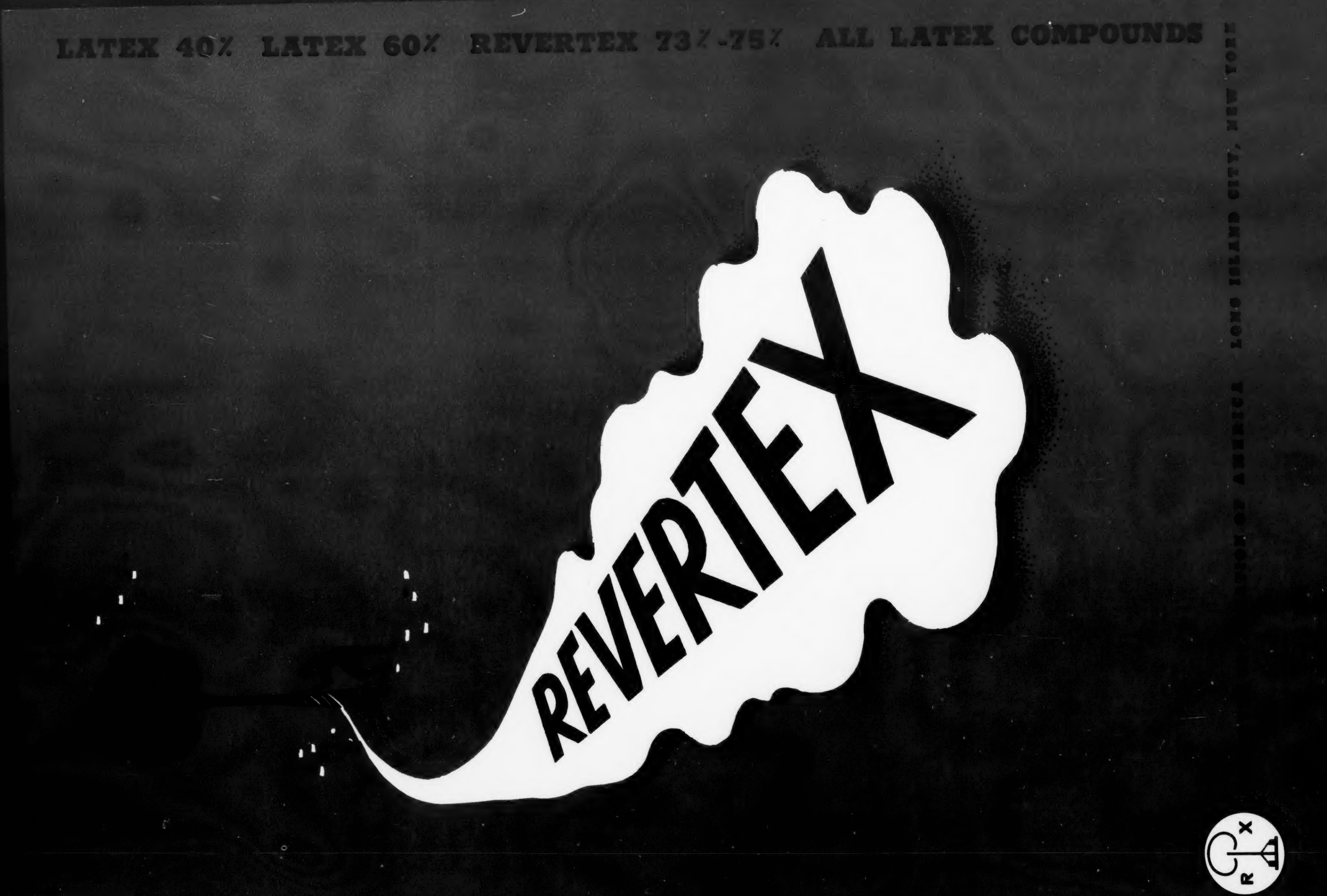
### 25 Years Ago—November, 1916

No substitute for sulphur in the vulcanization of rubber has yet been discovered or invented. Possibly none is in sight now, but the exceedingly interesting experiments of the eminent Russian chemist, I. I. Ostromislensky, lead one to think otherwise. (p. 63)

United States patent No. 1,198,975 covers a process of regenerating vulcanized rubber which consists in comminuting the material, boiling it in an alkaline solution, and heating the entire mass in an atmosphere of inert gas to a temperature approaching the melting point, and continously stirring the mass. (p. 74)

A San Francisco chemist has discovered that the candlewood shrub, or *ocotillo*, which abounds in the arid plains of Arizona and New Mexico, contains large quantities of a rubber-like or gutta-like gum. A tire was compounded by the W. C. Hendrie Rubber Co., Torrance, Calif., from *ocotillo* gum, smoked sheet rubber, sulphur, zinc, white lead, litharge, and other common compounding ingredients. (p. 75)

Detachable rubber pads, which may be slipped over metal automobile pedals, are now being manufactured. (p. 86)


LATEX 40% LATEX 60% REVERTEX 73%-75% ALL LATEX COMPOUNDS
REVERTEX
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# LATIN AMERICA

## PERU[1]

Once again Peru will embark—but with many important changes—upon an industry which proved so profitable in the earlier part of the century—that of growing rubber. The last of the big years for the country was 1917 when rubber production totaled 2,562,000 kilograms, or more than 5,500,000 pounds. The following year output was halved and thereafter was practically nil.

Now, however, as a result of the survey conducted by the United States Department of Agriculture on the possibilities of rubber growing in Latin America, which covered Peru from August to November last year, the country will resume rubber production. Already two nurseries have been established: one at Tingo María Valley in the eastern foothills of the Andes; and the other at Oromina, in the Upper Amazon basin and scene of an early unsuccessful attempt to grow plantation rubber in Peru. The existing trees will be used merely to teach up-to-date tapping methods. This second nursery features seedlings from native Peruvian rubber seeds, and by the end of the year buds of high-yielding, disease-resistant rubber strains will be grafted to the stocks, and the budded stumps will be available for plantations. These buds will come from improved strains originating in the Far East and imported from increase gardens already established in tropical America under the inter-American rubber project.

It is also felt that the wild native trees, so wretchedly exploited in the past, are now fully restored and hold some prospect for production in the near future.

But in general Peru expects to reap its harvest from cultivated plantations operated by modern methods. Thus the *seringueros,* instead of hacking, and often seriously damaging, if not killing, the tree, at bark and wood with a *machadiño* (small hatchet) and drawing the latex from several openings into small cups, will be equipped with tapping knives; a single surface will be tapped, and one tin cup will be utilized per tree. Another innovation will be the preparation of smoked sheets for shipment in contrast to the old system of collecting the rubber into huge black balls, frequently containing much foreign matter and moisture, and shipping in this form.

[1] Abstracted from "Peru Is on the Job." *Agriculture in the Americas,* Oct., 1941, pp. 6-9.



See page 211

**Note Differences between the *Cryptostegia* from Florida (*Right*) and from Mexico (*Left*)**

# MEXICO

Peter Heinz, of Brownsville, Tex., U. S. A., reports that recent explorations by the Mexican Government have discovered many practically unknown plants which are promising new sources of rubber. Outstanding is one plant generally identified as *Cryptostegia*,[1] which, however, does not quite correspond to specimens from Florida under that name. (See illustration.) The Mexican plants contain more latex and are larger and more robust; no opportunity, though, was presented to compare the plants in flower. The latex from the Florida plant does not yield a solid ball on the fingers, but leaves only a sticky mass and contains far less solids.

The *Cryptostegiae* were collected throughout an area in Mexico about 300 miles long, north and south, by about 70 miles wide, comprising the coastal plains and foothills along the Gulf of Mexico immediately south of the Texas border. The original plants, it is thought, were brought from Madagascar by early colonists and have become naturalized.

The plants found wild in Mexico and those grown from seed in various trial plantings show great variation in habit of growth and in the amount of latex between different individual plants in the same locality and between plants grown in different soils and climatic environments.

[1] For a discussion of *Cryptostegia* in Florida see "The Rubber Content of Two Species of *Cryptostegia* and of an Interspecific Hybrid in Florida" by Lorin G. Polhamus, Harlan H. Hill, and Joseph A. Elder. Technical Bulletin No. 457, Dec., 1934, United States Department of Agriculture, Washington, D. C.

# ECUADOR

The United States Department of Agriculture on September 26 formed a mission to study the agriculture of Ecuador and to formulate, in cooperation with the Ecuadoran Government, a program of agricultural diversification with special emphasis on crops for which there is normally good export demand. One of the specific items for consideration is the development of plantation rubber production.

As part of its program to develop the production in Latin America of tropical agricultural products needed by the United States, the Department, at the request of the Ecuadoran Government, has already made preliminary surveys of rubber-growing possibilities and general agricultural production there. In consequence an Ecuadoran agricultural experiment station program under the direction of Arthur G. Kevorkian, formerly of the Department, has been established as well as the pres-

ent mission, which will formulate an actual production program.

Two members of this mission, Walter R. Schreiber and Wm. A. Larner, Jr., of the Office of Foreign Agricultural Relations, left New York for Guayaquil, Ecuador, September 26, to be followed by Ernest G. Holt, chief of the Biology Division of the Soil Conservation Service, who has been lent to the Office of Foreign Agricultural Relations to head the mission, and four other agricultural technicians.

## CUBA

Compania Industrial Cubana de Gomas, S.A., Matanzas, began manufacturing rubber shoes of all types on October 14, according to David Schrage, owner and president, 1650 Broadway, New York, N. Y. Construction of the plant, started in October, 1940, is continuing, and it is expected that other articles, including bicycle tires and tubes, molded goods, mechanical goods, rubberized fabrics, imitation leather, and sponge rubber, will be in production and on the market within the next two months. Production facilities for automobile tires will be ready by April, 1942, and initial output is estimated at 200 casings daily. With 350 employes at present, the company expects to employ a total of 700 when the plant is completed next year.

# EUROPE

## GREAT BRITAIN

### Promoting Export to Dutch and Belgian Colonies

Both the Netherlands and Belgium have established chambers of commerce in London, and recently these bodies have taken steps to further British trade with the Dutch and Belgian colonies respectively. The Netherlands Chamber of Commerce has appointed representatives in the Netherlands East and West Indies; it will thus maintain close touch with conditions in those parts and be in a position to give British manufacturers advice on trade conditions and opportunities for business, etc. British exporters will be assisted in similar fashion by the Belgian Congo Information Bureau, newly formed under the auspices of the Belgian Ministry of Colonies as a separate department of the Belgian Chamber of Commerce in London.

### Notes

W. T. Henley's Telegraphs Works Co. at its annual meeting declared a final ordinary dividend of 10% and a bonus of 5%, to bring total distribution for 1940 to 20%, the same as was turned out in the three preceding years. Net profits were £320,565, against £343,853 the year before.

The business known as Dynaflex, formerly conducted by Manganese Bronze & Brass Co., Ltd., Dunstable, Beds., in association with the Empire Rubber Co. has been taken over by the recently established Rubber Bonders, Ltd. Direction, management, personnel, and financial control are the same.

British Resin Products, Ltd., now produces a good quality coumarone-indene resin from British raw materials. The product, marketed as "Epak" Coumarone Resin C46, is a hard, high-melting, pale resin, with good compatibility with rubber and stearin, also with neoprene and similar products. Hitherto

such resins, used in cable stock, adhesive tape, heels, soles, etc., have been imported from America. The new product is sold at a price said to be competitive with that of the imported material.

Imperial Chemical Industries, Ltd., is asking the trade to save neoprene scrap. Scorched neoprene can be readily converted into reclaim on standard equipment by a method earlier described by the concern. It also announces that in treating scrap containing a thioplast, one part by weight of Vulcafor DPG should be added on the mill to every 100 parts by weight of crumb. But before this addition care should be taken to have the temperature of the back roll at 70° C. and of the front roll, at 50° C. When the rough sheet has formed, the usual procedure for reclaiming neoprene is continued. To prevent shrinking and drying during storage, the company further suggests the addition of naphthalene to the finished reclaim.

# GERMANY

### Vinoflex

The recent Vienna Spring Fair included a variety of synthetic materials suitable for preparing varnishes from the I. G. Farbenindustrie, among which were the so-called Vinoflex products. The latter, said to be resistant to alkalies and acids, are considered valuable substitutes for chlorinated rubber. A demonstration was given of their use on light metals, the protection of which is generally recognized to be very difficult. The different types of Vinoflex are also claimed to be useful for improving tars and bitumens; very small quantities of the synthetic apparently are sufficient to achieve a marked effect.

### Development of Polyamides

The latest group of thermoplastics developed are the polyamides. Whereas their value as substitutes for various fibers has received most attention in America where they are already widely known as substitutes for silk (nylon) and bristles for toothbrushes and the like (Exton), for instance, German technologists and manufacturers are very little interested in these uses, concentrating rather on their possibilities in other directions.

Polyamides resemble natural proteins (silk, wool, etc.) in structure and are produced by condensation of dicarboxylic acids with diamines or by autocondensation of amine-carboxylic acids. They are distinguished from other known thermoplastics by their unusually high resistance to cold, (down to —70° C.), their high softening point, reaching up to 250°; their absolute fastness to light and their incombustibility. They are also resistant to most technical solvents as benzine, benzol, chlorinated hydrocarbons, etc. Mixed polyamides can also be produced, which differ in their properties from those of their components; thus many of these mixed polyamides are soluble in alcohol, hence useful for impregnations, varnishes, etc.

Owing to their comparatively low molecular weight which varies between 10,000 and 30,000, polyamides readily pass over into a fluid state when heated and, unless oriented by stretching or racking processes, have relatively low mechanical strength. They are remarkably extensible, however, and, when stretched, show a surprising increase in tensile strength which may be as much as five to eight times that of the original strength. Lupamides, the polyamide products of the I. G. Farbenindustrie, A. G., Frankfurt a.M., when racked, are said to have a tensile strength equal to that of light metals; while thin Lupamide threads have tensile up to 55 kg./mm.[2] or equal to steel. In general these products are claimed to retain their high extensibility within temperature zones ranging from —50 to +80°.

The protein-like structure of the polyamides brings with it certain disadvantages: chemical resistance is lower than that of other types of thermoplastics, and water-absorption is high, from 2 to 3% at room temperature and 8 to 12% in boiling water. But these products can be worked like other synthetics, that is cast, compressed, extruded, molded (hot or cold),

dipped, etc., and are considered to have good possibilities, among others also for mechanical purposes.

The I. G. Farbenindustrie markets the following polyamide products: Lupamide A, which has a heat resistance of 220 to 230°, according to Vicat; Lupamide B, with heat resistance of 165 to 180° (Vicat); Lupamide 6A, heat resistance of 140 to 160° (Vicat); and, finally, thermoplastic Lupamide 85B, which is considered to have valuable properties as a substitute for leather.

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### Buna Plant Bombed

Reports from England state that about the middle of September last, the R.A.F. attacked the large buna factory at Huls in the Rhineland. It seems that direct hits were made, and it is claimed that extensive fires were left burning.

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# FAR EAST

## MALAYA

### Data on the Rubber Planting Industry in 1940

The Economics Branch of the Department of Agriculture, S.S. and F.M.S., has issued its annual review of the rubber planting industry in Malaya covering 1940. At the end of the year the area planted to rubber totaled 3,480,989 acres, of which 2,119,861 acres were estates of 100 acres and over, and 1,361,128, small holdings of less than 100 acres. The greater number of the estates have planted area between 100 and 500 acres (1,546 estates, 316,646 acres); 362 estates between 500 and 1,000 acres, covered 260,774 acres; but estates between 1,000 and 5,000 acres accounted for the largest total acreage (560 estates, 1,130,185 acres). Fifty-four estates, each over 5,000 acres, covered 412,256 acres.

The estate acreage included 1,812,894 acres of mature rubber, that is rubber planted during 1932-33 and earlier; the immature area was 306,967 acres. In 1940 the total area newly planted was 23,454 acres (estates 19,884 acres; small holdings 3,570 acres); while the area replanted came to 63,052 acres (estates 49,033 acres and small holdings 14,019 acres.)

Budgrafting on estates further increased to 1,055 areas with total acreage of 356,552 acres against 837 areas covering 284,-275 acres in 1939 and 733 areas covering 248,591 acres in 1938.

Of the total rubber area on estates, 74.5% is European owned; Chinese own 16.6%; Indians, 4.4%, and other nationalities, 4.5%. At the end of 1940 2,522 rubber estates, of which 850 covering 1,536,080 acres were owned by public limited liability companies; while the remainder were owned by private limited liability companies or were privately owned. To care for and work these estates 351,631 coolies, including women and children, were employed in 1940, against 324,193 persons the end of 1939.

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### Rubber Production and Exports

In 1940 Malaya produced the record amount of 549,327 tons, compared with 361,484 tons in 1939 and 360,898 tons in 1938. Of these amounts, estates produced 334,408 tons, 244,915 tons, and 246,220 tons respectively. Outputs from small holdings in the same years were 214,919, 116,569, and 114,678 tons, respectively. The increase in the 1940 production by small holdings, which was about 85% higher than that for 1939, was due not only to the higher restriction releases, but also to the improved prices which encouraged tapping. Shipments of crude rubber in 1940 from Malaya (including Brunei and Labuan) totaled 540,417 tons.

The demand for latex fluctuated considerably during the

year, but although greater interest was shown by American manufacturers toward the year-end, the amount of latex shipped from Malaya in 1940 was 22,245 tons, or 270 tons less than in 1939. The gross exports of latex from Malaya since 1931 are shown in the table below:

GROSS EXPORTS OF LATEX — TONS

| | Dry Rubber Content of Latex in Pounds per Gallon | | | | |
|---|---|---|---|---|---|
| Year | Under 4.8 Lbs. | 4.8 to 5.7 Lbs.* | Over 5.7 Lbs.* | Total | Value |
| 1931 | † | † | † | 1,925 | $472,123 |
| 1932 | † | † | † | 5,192 | 1,110,103 |
| 1933 | † | † | † | 10,470 | 2,871,407 |
| 1934 | † | † | † | 14,172 | 7,119,548 |
| 1935 | 5,286 | 5,490 | 2,374 | 13,150 | 6,585,369 |
| 1936 | 6,778 | 7,073 | 3,086 | 16,937 | 10,673,229 |
| 1937 | 7,122 | 7,512 | 4,774 | 19,408 | 15,429,910 |
| 1938 | 3,630 | 4,554 | 6,747 | 14,931 | 8,686,793 |
| 1939 | 5,133 | 13,936 | 3,446 | 22,515 | 16,451,918 |
| 1940 | 3,384 | 15,731 | 3,130 | 22,245 | 20,000,002 |

† Dry rubber content not given prior to 1935.
* For the years 1939 and 1940 the breakdown is "4.8 to 5.9 Lbs." and "Over 5.9 Lbs."

Crude rubber consumption by local manufacturers of tires, tubes, belting, shoes, etc., increased in 1940 to 1,382 tons from 511 tons in 1939.

## Areas Out of Tapping

As expected, the area out of tapping decreased considerably at the end of 1940. The figure for estates was 177,756 acres, or 9.8% of the estimated tappable area, against 347,416 acres, or 18.7%, in 1939. In addition 211,149 acres, or 11.7%, were being rested under rotational tapping systems, against 281,051 acres, or 15.1%, in 1939. On small holdings of less than 100 acres, the untapped area at the end of 1940 was 201,900 acres, or 16%.

## Improving and Modifying Rubber

During 1940 many important investigations were in progress, including preservation of latex and new methods of concentration, both by creaming and centrifuging. The study of the variability of estate sheet rubber was continued, with many estates cooperating with the Rubber Research Institute of Malaya. The effects of the so-called "slaughter tapping" carried out on areas destined to be replanted have received special attention.

Work on producing rubber with low water absorption properties has progressed to the point where it was possible to send large-scale samples of such rubbers to American consumers for examination. Softened rubber is now being manufactured on a commercial scale in Malaya and is meeting with considerable interest both in Europe and America. Patents for the processes have been applied for.

Efforts are continuing to improve the quality of rubber, and several new refinements are under investigation with a view to their introduction in estate factories.

## Production and 120% Quota

Increasing the export quota to 120% was a none too pleasant surprise to rubber producers, and much doubt is frankly expressed as to whether outputs will be substantially increased. With 120% release, Malaya, Netherlands India, Ceylon, India, Burma, North Borneo, and Sarawak, should together theoretically produce 149,900 tons monthly, Malaya's share being 64,800 tons. But as the *Straits Times* Financial Correspondent points out, at the end of June, with 100% release, not one of these territories had exported the full amount of their allowance. Although outputs are usually better in the second half of a year than in the first, it is considered doubtful whether the raising of the exportable allowance will result in the actual production of more rubber than was produced in the second quarter of 1941.

Among the factors for and against the fulfilling of the new quota may be considered, first, the likelihood that there will now be no market for export rights and coupons; indeed their market value has already declined steeply in the past month. Under these circumstances, many, especially among the native rubber growers, will have to resume tapping. Again, some estates may be able to increase outputs by tapping areas now rested or by introducing more intensive tapping systems. But

over against this is the undoubted labor shortage which in certain sections of the country has already prevented estates from filling the 100% quota, and this condition seems to have been aggravated by labor unrest. If the reported shortage of rice causes any considerable increase in the price of this important foodstuff, labor difficulties are not likely to decrease. In any case estates would have to find ways to offset this further increase in the cost of living to their labor, and incidentally whatever the means adopted, they will add to the cost of producing rubber.

Apart from this aspect of the matter, a substantial increase in the price of rice and probably other foodstuffs, usually has the effect of causing those natives who grow rubber only as a side line to pay much more attention to food crops and neglect rubber, a tendency which is much more marked among natives in Netherlands India than in Malaya.

# NETHERLANDS INDIA

### Creation of Rubber Export Bureau

Following the initiation of the single buyer system in the United States, it was deemed necessary for local exporters and producers to decide upon some method of cooperation. Consequently the ten leading exporting firms here worked out a plan providing for the formation of a Rubber Export Bureau to which all estate rubber from Java and South Sumatra is to be offered. The Bureau then allocates the rubber to exporters; however, the producers and exporters concerned conclude contracts themselves through brokers in the usual way.

Up to the latter part of August the Bureau had not yet begun to function, as various points had still to be cleared up regarding the status of producers who were in the habit of exporting their rubber themselves before the formation of the Bureau; then it had also to be decided to what extent exporters, besides the ten shippers who sponsored the scheme, will be entitled to participate in the exports. The question of native rubber seems to have been shelved, for the present at least.

The uncertainty about the action of the Bureau relative to exporters caused a feverish buying up of all rubber offered on the market; exporters paid as much as 32¾ cents (Dutch currency) per half kilo for standard sheet and up to 33⅜ cents for standard crepe for August and September delivery, prices which left no margin for shippers and took no account of loss

(*Continued on page* 206)

# Editor's Book Table

## BOOK REVIEWS

**"Annual Report on the Progress of Rubber Technology."** Vol. IV. 1940. Published by the Institution of the Rubber Industry, 12 Whitehall, London, S.W.1, England. Paper 7¼ by 9¾ inches, 159 pages. Subject and author indexes. Price: I.R.I. members, 2/6; non-members, 10/6.

Volume IV of this annual review summarizes progress during 1940 in the principal branches of rubber technology and manufacture. The 24 chapters of the present work cover essentially the same ground as did Volume III, but four chapters have been written by new authors. The scope of the work is broad and includes: planting, properties of raw and vulcanized rubber, test equipment, compounding ingredients, fibers and textiles for rubber, machinery, sponge and hard rubber, and the technology of the manufacture of tires, belting, hose, cables, footwear, mechanical goods, roads, flooring, etc. Each phase of the work has been competently dealt with by an authoritative worker in that field. Total references to the literature and patents which appear at the end of the respective chapters number 1,281.

**"Rubber Red Book."** Published by *The Rubber Age*, 250 W. 57th St., New York, N. Y. Cloth, 6 by 9 inches, 512 pages. Price, $5.

Issued biennially, this directory of the rubber industry and its suppliers has been revised, enlarged, and brought up to date. A new section, accessories and fittings, has been added; while the data formerly included in a section on "Miscellaneous Types of Rubber and Allied Materials" are now presented more completely in new sections on "Rubber Derivatives" and "Synthetic Rubbers and Rubber-Like Materials" and in the section on crude rubber, now expanded to include "related materials." The number of pages has been increased from 422 to 512.

The 1941 edition besides incorporating the revisions and additions above, continues to include sections on: rubber manufacturers in the United States classified alphabetically and according to product and geographical location; Canadian rubber manufacturers; rubber machinery and equipment; rubber chemicals and compounding ingredients; fabrics and textiles; reclaimed rubber; scrap rubber dealers; rubber latex; miscellaneous products and services; consulting technologists; manufacturers' representatives, sales agents, branch offices, etc.; technical journals; trade and technical organizations; and "Who's Who in the Rubber Industry."

The volume which compiles and correlates an extensive amount of data continues as a complete and convenient directory for this field.

**"Chemical Engineering Catalog."** Twenty-sixth Annual Edition, 1941. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York, N. Y. Cloth, 8¼ by 11¼ inches, 1214 pages. Indexed.

Following the lines of previous editions, the current issue of this standard reference work for the process industries publishes information contributed by several hundred firms manufacturing equipment and supplies for chemical and related industries including rubber. In addition to cataloging equipment, supplies, industrial chemicals, and raw materials, the book includes sections on: laboratory and reagent chemicals; technical and scientific books; and various charts, tables, and nomographs.

**"Gist of the Fair Labor Standards Act."** Jacob S. Spiro and John Milton. Published by Legal Reviews, 101 Beekman St., New York, N. Y. 1941. Paper, 6 by 9 inches, 165 pages. Indexed. Price $1.50.

This working manual summarizes and analyzes the Federal Wage and Hour Law by reprinting the law and interspersing explanatory notes between the different sections. All terms are defined as they are used in the law, and many concrete examples of application of the law are given.

**"High Polymeric Reactions**—Their Theory and Practice." H. Mark and R. Raff. Published by Interscience Publishers, Inc., New York, N. Y. 1941. Cloth, 6¼ by 9¼ inches, 476 pages. Author and subject indexes. Price $6.50.

This, the third volume in this series, continues and expands the scope of the systematic survey of the high polymers, which was begun in the first two volumes of this series—"Collected Papers of W. H. Carothers on High Polymeric Substances", which covered the classical work of one of the foremost early investigators in this field, and "Physical Chemistry of High Polymeric Systems", a book devoted to showing how the fundamental laws of physical chemistry can be applied to the study of high polymers. In the present volume the aim is to show to what extent physico-chemical measurements will permit a quantitative explanation of the mechanisms of polymerization and polycondensations in the light of our present knowledge. Thus the authors are concerned with an elucidation of high polymer kinetics, developing their theory on the basis of the *preparative chemistry of high polymers* and the *kinetics of organic chemical reactions.*

The book is divided into two parts, the first treating the theory and mathematics involved, and the second, covering 145 organic and nine inorganic specific polymerizations and a section on polycondensations. The four main sections of the first part, with some of the more important subdivisions indicated in parentheses, follow: The Structure of High Polymers (covalent linkage; chain, net, and space polymers; and a list of important polymerizable and condensable substances); Some Data on Experimental Methods (physical and chemical tests; molecular weight and distribution curve; preparation of high polymers and measurement of reaction rates); Fundamentals of Reaction Kinetics (mechanism; fundamental types of reaction; and activation and energy transfer); and General Theory of the Mechanism of Polyreactions (step reactions and chain reactions). Polymerizations treated in the second part of the book wihch are of direct interest to the rubber chemist include: butene, butadiene and its homologs, isoprene, styrene, chloroprene, and vinyl halogenides and other vinyl compounds.

**"Minerals Yearbook Review of 1940."** Prepared under the direction of E. W. Pehrson; H. D. Keiser, editor. Published by the United States Department of the Interior, Bureau of Mines, Washington, D. C. Cloth, 6 by 9¼ inches, 1459 pages. Indexed. For sale by the Superintendent of Documents, Washington, D. C. Price $2.

Extensively documented with tables and charts, this reference book on minerals deals with such materials as carbon black and pigments of titanium, zinc, and lead, which are of direct interest to the rubber industry. Statistics are given as to production by localities, by periods of time, by methods and yields, etc.; demand in terms of total deliveries and domestic consumption; stocks; and prices and values. The textual matter attempts to detect trends and to analyze data so that the book is more than a mere compilation of statistics.

The book has 72 chapters, and each of the minerals discussed in previous editions is covered in the present work, often in more expanded form. A new chapter reviews principal developments during the year, detailing the establishment and organization of governmental defense agencies concerned with mineral problems.

## NEW PUBLICATIONS

**"Natural and Synthetic Rubbers."** Harry L. Fisher. Published by the American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. 31 pages. This pamphlet is a reprint of the Sixteenth Edgar Marburg Lecture which Dr. Fisher delivered at the annual A. S. T. M. meeting in Chicago, Ill., last June. The first part is devoted to a review of the properties, compounding, etc., of natural rubber; the second part deals with the production, properties, vulcanization, etc., of synthetic rubbers, and the third part of the lecture discusses the properties and applications of synthetic rubbers. A bibliography is included.

**"Zinc in Defense."** The New Jersey Zinc Co., 160 Front St., New York, N. Y. 4 pages. The uses zinc is finding in advancing the national defense program are shown by photographs and accompanying texts in this large folder. Thus, zinc oxide and sulphide are used in life rafts, surgical gloves, and other rubber products.

**"Carbon Black in Reclaim Bearing Tread Stock."** By F. H. Amon and H. H. Offutt. Godfrey L. Cabot, Inc., Boston, Mass. August, 1941. 8 pages. According to this pamphlet, the steps being taken to conserve crude rubber may result in more reclaim being used in high-grade tread stocks. In this study, tests were made on stocks based on 85 parts smoked sheet, 25 parts reclaim, and 37.5 parts carbon black, with four different grades of Spheron carbon black being used. The data and graphs show the characteristic influences of the four Spheron grades on tensile strength, abrasion resistance, curing rate, and electrical conductivity. The authors also express the thought that the addition of reclaim might improve milling and extrusion properties to the extent that a finer particle-size black could be used to improve abrasion resistance and electrical properties.

**"The Mill Room of the Future."** Bulletin No. 178. Farrel-Birmingham, Inc., Ansonia, Conn. 18 pages. This booklet reprints three articles, "Pellet Rubber", "Progress in Compound-Room Practice", and "Mill Room of the Future", which were originally published in the June 1, July 1, and August 1, 1941, issues of INDIA RUBBER WORLD.

**"Neville Coal-Tar Solvents."** The Neville Co., Neville Island, Pittsburgh, Pa. 39 pages. This booklet publishes text, tables, and graphs giving details regarding the various grades, specifications, and uses of coal-tar solvents produced by the manufacturer. Methods employed in testing the solvents are described, and specific gravity and temperature conversion tables are presented.

**"Symposium on Color**—Its Specifications and Use in Evaluating the Appearance of Materials." Jointly sponsored by the American Society for Testing Materials and the Inter-Society Color Council. Published by the American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. 79 pages. Price $1. Papers and discussions stressing the importance of adequate specifications for color and the use of color in testing and evaluation of materials are presented in this publication. The papers were heard at the spring meeting of the A. S. T. M. in Washington, D. C., as a Symposium on Color.

**"Report on Agricultural Research** for the Year Ending June 30, 1940." Two parts. Agricultural Experiment Station, Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa. Part I. 300 pages; Part II, 80 pages. This extensive report presents the results of the major activities of the Station, including reports on "Efficiency and Economy of Pneumatic Tires for Transport Wheels on Agricultural Equipment" and "Elasticity and Viscosity as Starch Characteristics." The former report is based on the comparative performance of steel wheels and pneumatic tires on two manure spreaders of the same model, a ratio dynamometer being used to obtain data on rolling resistance. In the second, an instrument for measuring both breaking strength and elasticity of starch on the same paste is reported.

**"Properties of Ameripol D."** Catalog Section 8000. B. F. Goodrich Co., Akron, O. 8 pages. Four tables present data on Ameripol D synthetic rubber in this pamphlet. The first table draws general comparisons between Ameripol, two other unspecified synthetic rubbers and natural rubber. Such properties of typical Ameripol D vulcanizates as Shore durometer hardness, elongation at break, tensile strength, rebound elasticity, etc., are listed in the second table; while the third table lists percentage volume increases after 48 hours' immersion of Ameripol D, natural rubber, and two other synthetic rubbers. The fourth table is an approximate index to the practicality of Ameripol under listed conditions. Besides the tables, the booklet also contains text and photographs describing the properties and applications of Ameripol D.

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EFFICIENT MAINTENANCE AND RUBBER MACHINERY. E. Morris, *India-Rubber J.*, Sept. 6, 1941, pp. 3-5, 9-10.

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# Patents and Trade Marks

## APPLICATION

### United States

2,250,568. **Adjustable Journal Box Mounting** with Resilient Units. O. V. Borup, Berwick, Pa., assignor to American Car & Foundry Co., New York, N. Y.

2,250,807. **Abdominal Supporter.** H. J. Lunney, Los Angeles, assignor of ½ to L. C. Spangard, Santa Monica, both in Calif.

2,250,813. **Valve Ball** with Resilient Cover for Hermetically Sealing Fluid Pressure. R. M. Rea, Oklahoma City, Okla.

2,250,840. **Throat Collar** Having a Rubber Body. E. Pomeranz, Washington, D. C.

2,250,881. **Engine Starter** with Blocks of Elastic Material Having a High Coefficient of Friction. M. P. Whitney, Elmira, N. Y., assignor, by mesne assignments, to Bendix Aviation Corp., South Bend, Ind.

2,250,909. **Fountain Sponge.** W. E. Habeck, Clintonville, Wis.

2,250,948. **Harvester** with Whip Lashes of Rubber-Impregnated Fabric. J. Garst, Palo Alto, Calif.

2,250,987. **Tread Member** for Shoes Comprising a Milled Rubber Composition Having a Substantial Proportion of Cork Granules Dispersed Therethrough; the Granules Being Impregnated with Latex Rubber and United Thereby to the Adjoining Portions of Said Composition. E. W. Dunbar, Hudson, assignor to Cambridge Rubber Co., Cambridge, both in Mass.

2,251,001. **Loud-Speaker and Driving Motor Therefor** with Rubber Cushioning Member. J. P. Quam, assignor to Quam-Nichols Co., both of Chicago, Ill.

2,251,039. **Bidet.** R. R. da Silva, Rio de Janeiro, Brazil.

2,251,095. **Vibratory Concrete Laying and Finishing Machine** with Rubber-Edge Hopper Walls. C. W. Wood, Los Angeles, Calif.

2,251,148. **Combined Flashlight and Bulb Remover** with Rubber-Covered Bulb Engaging Part. W. B. Masland, Millburn, assignor to Tung-Sol Lamp Works, Inc., Newark, both in N. J.

2,251,219. **Rubber-Like Fluid Seal** with Bellows Fold. O. Brummer, Oak Park, assignor to Crane Packing Co., Chicago, both in Ill.

2,251,262. **Nonmetallic Sheathed Conductor.** C. W. Abbott, Larchmont, N. Y.

2,251,318. **Seat Cushion Structure** with a Supporting Frame, and a Depressible Deck Comprising Rubber and Fabric Intimately Combined to Impart a High Hysteresis to the Deck. G. W. Blair, J. F. Schott, and W. E. Faulk, assignors to Mishawaka Rubber & Woolen Mfg. Co., all of Mishawaka, Ind.

2,251,347. **Rail Car Buffer** with Rubber Part. A. O. Williams and M. M. Dean, both of Battle Creek, assignors to Clark Equipment Co., Buchanan, all in Mich.

2,251,355. **Insulated Electrical Conductor** Utilizing Felted Asbestos, Glass Thread, and Rubber Hydrochloride. J. W. Greenleaf, Hamden, Conn., assignor to Rockbestos Products Corp., a corporation of Mass.

2,251,357. **Flush Valve.** W. L. Harroun, Ellisburg, N. Y.

2,251,398. **Motor Mounting** with Annular Resilient Member. G. D. Clark, Warren, O., assignor to General Motors Corp., Detroit, Mich.

2,251,400. **V-Belt Joint.** R. S. Colley, Kent, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,251,416. **Spring** Having an Annular Torsionally Active Plastic Body. G. H. Parker, Royal Oak, assignor to Chrysler Corp., Highland Park, both in Mich.

2,251,417. **Torsion Spring** Having a Body of Vulcanizable Plastic Material. G. H. Parker, Royal Oak, assignor to Chrysler Corp., Highland Park, both in Mich.

2,251,430. **Inflated Deicer System and Apparatus Operating It.** M. L. Taylor, Hudson, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,251,443-2,251,445. **Assembly** for Clutches, Brakes, Universal Joints, Etc. T. L. Fawick, assignor to Fawick General Co., Inc., both of Akron, O.

2,251,468. **Rubber Shoe Sole.** W. L. Smith, Bedford, Va., assignor, by mesne assignments, to Salta Corp., Jersey City, N. J.

2,251,522. **Setting Window Glass** Using Rubber Stripping. T. Nyberg, Auburn, Me.

2,251,531. **Hosiery** with Elastic Self-Supporting Top. P. L. Thurston and H. F. Hilker, Martinsburg, W. Va., assignors to Interwoven Stocking Co., New Brunswick, N. J.

2,251,590. **Obstruction Remover** with Rubber Plug for Drain Pipes. C. R. Harless, Beckley, W. Va.

2,251,640. **Level** Having a Rubber Tubular Body for Attachment to Pencils. R. N. Skrainka, University City, Mo.

2,251,646. **Sandblast Stencil** Comprising an Admixture of Whiting, Vulcanized Rubber, Glue, and at Least 5% by Weight of a Vulcanized Vegetable Oil. A. J. Wartha, assignor to Minnesota Mining & Mfg. Co., both of St. Paul, Minn.

2,251,647. **Sandblasting Stencil** Comprising Sheet Material Including Whiting and Glue Particles Bonded together by a Binder Consisting of Major Proportions of Rubber and Minor Proportions of a Vulcanized Vegetable Oil. A. J. Wartha, assignor to Minnesota Mining & Mfg. Co., both of St. Paul, Minn.

2,251,715. **Tube Coupling** with Yieldable Ring. A. L. Parker, Cleveland, O.

2,251,804. **Flexible Coupling** with Rubber Annuli. C. R. Reuter, assignor to Falk Corp., both of Milwaukee, Wis., and T. L. Fawick, Akron, O.

2,251,809. **Resilient Wheel.** C. Saurer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,251,811. **Stocking Top** Incorporating Elastic Yarn. E. St. Pierre, Pawtucket, R. I., and G. McDowell, Philadelphia, Pa., assignors to Hemphill Co., Central Falls, R. I.

2,251,837. **Trousers Rectifier** for Bowlegged Men. H. H. Stiefel, Brooklyn, N. Y.

2,251,887. **Rotary Fan** with Rubber Blades. E. P. Larsh, Vandalia, assignor to Master Electric Co., Dayton, both in O.

2,251,888. **Rotary Fan** with Metal-Reenforced Rubber Blades. J. Leflar, assignor to Master Electric Co., both of Dayton, O.

2,251,898. **Unitary Volt Reducing Drop Cord** with a Flexible Rubber Casing. C. C. Sittler, Chicago, and A. J. Godshalk, Downers Grove, both in Ill.

2,252,077. **Doll** with Elastic Rubber Skin. A. M. Katz, Brooklyn, assignor to Ideal Novelty & Toy Co., Long Island City, both in N. Y.

2,252,119. **Infant's or Invalid's Feeding Spoon.** H. N. Edmonds, Anderson, S. C.

2,252,128. **Frictional Torque Transmitting Device.** H. T. Kraft, assignor to General Tire & Rubber Co., both of Akron, O.

2,252,197. **Windowpane Fastener** with Resilient Stripping. W. C. Passer, Wauwatosa, Wis.

2,252,233. **Windshield Cleaner.** E. W. Sibley, Kenmore, assignor to Trico Products Corp., Buffalo, both in N. Y.

2,252,240. **Well Tubing Packing Device** with Elastic Sealing Member. S. P. Tschappat, Tulsa, Okla.

2,252,262. **Decoy.** P. F. Keays, Broken Bow, Nebr.

2,252,285. **Soundproof Wall Structure** Containing a Layer of Rubber. W. Eglinton, Reseda, and H. G. Cunningham, Los Angeles, both in Calif., assignors to Radio Corp. of America, a corporation of Del.

2,252,315. **Scuff** with Elastic Retaining Means. S. Doree, New York, N. Y.

2,252,335. **Resilient Car Wheel.** D. P. Steward, Johnstown, Pa.

2,252,428. **Bathinette** with Filling Hose and Spray Accessory Therefor. D. M. Kennedy, Rochester, and B. H. Kennedy, Pittsford, both in N. Y.

2,252,430. **Parquet Flooring Block** with a Film of Permanently Resilient Adhesive Flexibly Securing the Slats together and Lying in Spaces between Them. A. Klammt, New York, N. Y., assignor to W. M. Ritter Lumber Co., a corporation of W. Va.

2,252,431. **Laying a Wood Floor** by Securing Wood Strips together by Applying Spots of Adhesive to the Tongues and Inserting Them into the Grooves to Form a Series of Flexible Hinged Strips, Pressing the Strips into Adhesion with a Supporting Surface Having a Layer of Cold Aqueous Dispersion of Rubber, and Allowing the Dispersion to Set. A. Klammt, New York, N. Y., assignor to W. M. Ritter Lumber Co., a corporation of W. Va.

2,252,440. **Dynamolectric Machine** with an Outer Layer of Plasticized Polyvinyl Chloride on the Electrical Conductor. M. M. Safford, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,252,463. **Pencil and Eraser.** A. R. Jackley, Baltimore, Md.

2,252,505. **Trailer Window Frame** with Sponge Rubber Cushion Stripping. W. A. Harris, Elkhart, Ind.

2,252,510. **Windshield Cleaner.** E. C. Horton, Hamburg, assignor to Trico Products Corp., Buffalo, both in N. Y.

2,252,515. **Rail Fastening Means** Utilizing Resilient Washers. P. Landis, Zurich, Switzerland.

2,252,543. **Liquid Dispenser** with Deformable Elastic Sealing Member. L. Beeh, Longmeadow, Mass.

2,252,595. **Insole.** C. H. Daniels, Greenwich, Conn.

2,252,671. **Concealed Antenna Mounting** with Resilient Cushioning and Insulating Means. S. Ludwig, assignor to Ward Products Corp., both of Cleveland, O.

2,252,692. **Means for Applying Expansible Collars.** B. H. Barnes, San Marino, and B. S. Minor, Whittier, assignors to Bettis Rubber Co., Ltd., Los Angeles, all in Calif.

2,252,833. **Slip** with Elastic Fabric Panels. E. Cadous, Brooklyn, N. Y.

2,252,836. **Belting and Lining Material.** W. H. Curry and J. T. Potts, both of Salt Lake City, Utah.

2,252,846. **Acoustic Device** Having a Resilient Mounting Means. G. M. Giannini, Great Neck, and R. W. Carlisle, Greenburg, both in N. Y., assignors, by mesne assignments, to Associated Electric Laboratories, Inc., Chicago, Ill.

2,252,874. **Pressure Indicator.** A. Vischer, Jr., Park Ridge, assignor to Vischer Products Co., Chicago, both in Ill.

2,252,923. **Valve** with Distortable Ring Gasket. F. A. Granetz, Huntington, N. Y.

2,252,938. **Joint.** H. C. Lord, assignor to Lord Mfg. Co., both of Erie, Pa.

2,252,992. **Baby Panties.** M. B. Steiner, Oakland, Calif.

2,253,025. **Vibration Damping Means** for Cooling Fins. A. H. R. Fedden and F. Nixon, assignors to Bristol Aeroplane Co., Ltd., all of Bristol, England.

2,253,029. **Windshield Wiper.** F. D. Hart, Middlesboro, Ky.

2,253,042. **Railway Car Truck Suspension Means** with Rubber Shock Absorbing Elements. H. E. Muchnic, assignor to Locomotive Finished Material Co., both of Atchison, Kan.

2,253,063. **Golf Practicing and Scoring Device** with Rubber Ball and Elastic Cable. C. W. Deibel, Youngstown, O.

2,253,103. **Truss.** W. H. Barlow, Stroud, Okla.

2,253,141. **Resilient Roller and Mounting Therefor.** E. L. Schofield, assignor to Henney Motor Co., both of Freeport, Ill.

2,253,210. **Gum Massagers.** N. Psiharis, Chicago, Ill.

2,253,230. **Safety Inner Tube** for Pneumatic Tires. I. Feldman, Brooklyn, N. Y.

2,253,249. **Wiper Blade.** C. C. Petersen, Woburn, assignor of 30% to C. H. Petersen, Saugus, both in Mass.

2,253,272. **Fire Hose Nozzle Holder** with Resilient Pads. E. E. Hansen, Elkhart, Ind., assignor to Elkhart Brass Mfg. Co., a corporation of Ind.

2,253,306. **Motor** with Elastic Sealing Pads. K. K. Probst, Detroit, Mich., assignor, by mesne assignments, to W. L. Hoburg, Sharpsburg, Pa., as trustee.

2,253,310. **Suction Cleaner** with Flexible Rubber Tube Mounting. D. G. Smellie, Canton, assignor to Hoover Co., North Canton, both in O.

2,253,429. **Metatarsal Pad.** R. L. Hess, Elgin, Ill.

2,253,571. **Syringe Bag.** T. W. Miller, assignor to Faultless Rubber Co., both of Ashland, O.

2,253,635. **Wig** with Elastic Rubber Skull Piece Having Hair Embedded Therein. J. J. Mann, Milwaukee, Wis.

2,253,746. **Safety Tube** Comprising Inner and Outer Flexible Annular Chambers Having a Common Base. C. H. Zimmerman, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,253,801. **Pneumatic Upholstery.** C. H. Neal, Venice, Calif.

2,253,813. **Mat.** H. R. Russon, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,253,837. **Equine Boot** with Flexible Means for Retaining Liquid around an Animal's Leg. O. Augspurger, Rockford, Ill.

2,253,860. **Waterproof Rubber and Fabric Footwear** Having Foot and Leg Portions. F. H. Martin, Belmont, Mass., assignor to B. F. Goodrich Co., New York, N. Y.

2,253,902. **Slip** with Elastic Fabric Gores. P. Z. Gordon, New York, N. Y.

2,253,904. **Packing Ring.** W. Haug, assignor to Kupper-Asbest-Co. Gustav Bach, both of Heilbronn-on-the-Neckar, Germany.

2,253,910. **Combination Toothbrush and Gum Massager.** F. Luenz, Hartford, Conn.

2,253,959. **Combination of Resilient Pad and Cutout Insole.** M. Margolin, Elgin, Ill.

2,253,967. **Insulated Electrical Conductor** Having an Outer Covering of Vulcanized Polymerized Butadiene Derivative. L. Carl, Berlin-Friedenau, and P. Nowak, Berlin-Charlottenburg, both in Germany, assignors to General Electric Co., a corporation of N. Y.

2,253,995. **Infant's Folding Bath Stand and Dressing Table.** W. C. Baxter, Rochester, and C. T. De Puy, Brighton, assignors to Trimble Nurseryland Furniture, Inc., Rochester, all in N. Y.

2,253,996. **Exerciser** Utilizing Rubber Pedal Pads. W. B. Bechman, Montgomery, Ala.

2,254,000. **Tire Valve.** L. C. Broecker, assignor to Bridgeport Brass Co., both of Bridgeport, Conn.

2,254,024. **Flexible-Bladed Fan.** L. Zaiger, Lynn, Mass.

2,254,060. **Oil Well Packing Element** with a Cylindrical Elastic Body. C. S. Crickmer, assignor to Merla Tool Co., both of Dallas, Tex.

2,254,110. **Storage Battery** with Soft Rubber Strip Imparting Yieldability to the Battery Seal. G. E. Petrosky, assignor to Electric Storage Battery Co., both of Philadelphia, Pa.

2,254,167. **Window Lock** with Rubber Latching Element. W. C. Carpenter, Grafton, assignor to F. M. Slough, Cleveland, both in O.

### Dominion of Canada

398,770. **Parting Compound** Comprising Powdered Base Material Formed of Shells of Hard Shelled Nuts and Impregnated with Waterproofing Material. P. J. Weber and C. F. Witters, co-inventors, both of Milwaukee, Wis., U. S. A.

398,772. **Shaft Bearing** with Rubber Sleeves. E. S. Aker, Belleville, N. J., U. S. A.

398,773. **Apple Grader and Sizer** with Inflated Rotatable Rubber Member. N. M. Bartlett, Beamsville, Ont.

398,786. **Electrical Installation** with Resilient Cylindrical Bushing. H. A. Jaberg, Cincinnati, O., U. S. A.

398,787. **Detachable Non-Slipping Device for Shoes** Comprising a Strip of Elastic Material Provided with Spurs. F. O. Lawson, Greensboro, N. C., U. S. A.

398,794. **Surgical Mask.** C. Panettiere, Miami Beach, Fla., U. S. A.

398,809. **Loom Clip.** Amalgamated Electric Corp., Ltd., assignee of S. Langley, Toronto, Ont.

398,815. **Railway Car Truck** with Resilient Pads. American Steel Foundries, assignee of R. B. Cottrell, both of Chicago, Ill., U. S. A.

398,855. **Battery Paste Retainer** Consisting of a Perforated Vulcanized Hard Rubber Covering Contained in an Air-Tight Bag. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. W. Keen, Packanack Lake, N. J., U. S. A.

398,885. **Air Filter** with Compressible Sealing Washers. New York Air Brake Co., New York, assignee of C. A. Campbell, Watertown, both in N. Y., U. S. A.

398,926. **Printing Plate** with Water-Receptive Areas Comprising a Polyvinyl Alcohol. W. C. Toland and E. Bassist, co-inventors, both of Brookline, Mass., U. S. A.

398,935. **Helicopter** with Suction Bell Having Silk and Elastic Fringes. A. J. Bell, Courtenay, B. C.

398,944. **Wringer Roll.** N. L. Etten, Waterloo, Iowa, U. S. A.

398,955. **Colonic Irrigator.** H. Lazarus, New York, N. Y., U. S. A.

398,969. **Clothes Wringer.** J. L. Perkins, West Springfield, Mass., U. S. A.

399,016. **Braking Mechanism.** Firestone Tire & Rubber Co., assignee of J. W. Hatch, both of Akron, O., U. S. A.

399,031. **Belt Conveyer and Idler** with Annular Elastic Members. Link-Belt, Ltd., Toronto, Ont., assignee of C. R. Weiss and R. W. Parker, co-inventors, both of Indianapolis, Ind., U. S. A.

399,038. **Mud Screen.** Nordberg Mfg. Co., Milwaukee, Wis., assignee of L. G. Symons, Hollywood, Calif., both in the U. S. A.

399,039. **Combine Cylinder Beater Bar** with Layer of Rubber. Ohio Rubber Co., assignee of J. F. McWhorter, both of Willoughby, O., U. S. A.

399,063. **Friction Shock Absorber** with Expansible Sleeve. Thompson Products, Inc., assignee of J. R. Snyder, both of Cleveland, O., U. S. A.

399,066. **Hat** with Elastic Tape Securing the Sweat Band with a Springy Action. United States Rubber Co., New York, assignee of S. Adamson, Rye, both in N. Y., U. S. A.

399,096. **Laminated Elastic Fabric.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of M. C. Teague, Ridgewood, N. J., and T. G. Hawley, Jr., Naugatuck, Conn., co-inventors, both in the U. S. A.

399,118. **Jacket** with Elastic Fabric Back Panel. F. Jones, Toronto, Ont.

399,143. **Electrolytic Cell** with Rubber Disk Cover. Aerovox Corp., New Bedford, Mass., assignee of H. Waterman, Los Angeles, Calif., both in the U. S. A.

399,157. **Fibrous Padding** Using a Flexible Binder. F. Burkart Mfg. Co., assignee of O. R. Burkart, both of St. Louis, Mo., U. S. A.

399,181. **Vibration Insulator.** Firestone Tire & Rubber Co., assignee of E. F. Riesing, both of Akron, O., U. S. A.

399,194. **Pipe Joint** with Resilient Gasket. Lock Joint Pipe Co., East Orange, assignee of W. W. Trickey, Essex Fells, both in N. J., U. S. A.

399,195. **Chair Leg Support** with Rubber Bushing. Lord Mfg. Co., assignee of H. C. Lord, both of Erie, Pa., U. S. A.

399,238. **Packaging Method** Utilizing Rubber Hydrochloride Film. Wingfoot Corp., Wilmington, Del. assignee of R. H. Ritchings, Hudson, O., both in the U. S. A.

399,265. **Light-Polarizing Material** Having a Transparent Sheet of Polyvinyl Alcohol Containing Dichroic Molecules. E. H. Land, Boston, and H. G. Rogers, West Newton, co-inventors, both in Mass., U. S. A.

399,274. **Artificial Foot** Including an Elastic Body and an Inflatable Cushioning Element. H. C. Campbell, Youngstown, O., U. S. A.

399,289. **Railroad Car Air Hose.** J. H. Phillips, Jackson, Mich., U. S. A.

399,292. **Tire Casing** with a Plurality of Annular Parallel Walls Depending Inwardly from the Tread to Form Free Annular Lips Forming Independent Annular Openings through Each of Which an Inner Tube Is Insertable. H. H. Salb, Toronto, Ont.

399,294. **Flower Holder.** R. W. Simpson, New York, N. Y., U. S. A.

399,296. **Cosmetic Applicator** Having a Plurality of Porous Rubber Sheet Filters. E. J. Smith, Elyria, O., U. S. A.

399,333. **Brake Piston Seal** with Concentric Elastic Sleeves. Detroit Hydrostatic Brake Co., assignee of C. Sauzedde, both of Detroit Mich., U. S. A.

399,336. **Filtering Apparatus** with a Filter Comprising a Porous Laminated Sheet Having a Ply of Porous Fibrous Material and a Ply of Perforate Rubber Material. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of H. C. Tingey, Nutley, N. J., U. S. A.

399,339. **Tennis Ball.** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of S. G. Ball, Birmingham, Warwickshire, England.

399,350. **Suction Cleaner** with an Accordion-Like Rubber Tube Connection. Hoover Co., North Canton, assignee of D. G. Smellie, Canton, both in O., U. S. A.

399,374. **Spinning Bobbin** with Rubber Bushings. Saco-Lowell Shops, Boston, Mass., assignee of J. A. Kennedy, Saco, Me., both in the U. S. A.

399,389. **Artificial Leather** Comprising 60% Matted Wood Pulp Fibers Impregnated with 30% of Latex Solids and 10% Blood Albumin Glue. Tufide Products Corp., assignee of H. A. Sheesley, both of Portland, Me., U. S. A.

399,404. **Tire Cords** Comprising Cellulosic Yarns Having 0.5 to 5.0%, Based on the Weight of the Yarn, of Tricresyl Phosphate Incorporated Therein. C. Dreyfus, New York, N. Y., co-inventor with an assignee of G. Schneider, Montclair, N. J., both in the U. S. A.

399,417. **Colored Regenerated Leather** Produced from an Aqueous Fibrous Suspension of Disintegrated Leather Fibers, Latex Containing the Usual Compounding Ingredients, and a Dyestuff. International Latex Processes Ltd., St. Peter's Port, Channel Islands, assignee of G. Galimberti, Milan, Italy.

### United Kingdom

538,258. **Buoyant Jacket.** R. N. C. Boyes.

538,370. **Footwear.** Soc. Anon. pour le Commerce et l'Industrie du Caoutchouc and Rollmann, Kaufmann & Co.

538,420. **Hot-Water Bottles.** Dunlop Rubber Co. Ltd., L. Harral, and G. B. Ainsworth.

538,447. **Insulated Electric Conductors.** Philips Lamps, Ltd.

538,455. **Fire Hose.** G. Angus & Co., Ltd., and M. Balkin.

538,460. **Control Mechanism** for Aircraft Wheel Brakes. Dunlop Rubber Co., Ltd., and H. Trevaskis.

538,546. **Vehicle Tires and Wheels.** Dunlop Rubber Co., Ltd., G. Livings, and G. H. Perry.

538,625. **Resilient Couplings.** M. F. A. Julien.

538,638. **Resilient Joints or Mountings.** H. C. Lord.

538,827. **Electric Cables and Insulation Therefor.** Telegraph Construction & Maintenance Co., Ltd., J. N. Dean, and J. Webster.

538,888. **Milking Machine Teat Cups.** Aktiebolaget Separator.

538,971. **Membranes Made of Rubber.** Z. Martos.

539,005. **Sealing Ring or Washer** for a Dust Shield. Dunlop Rubber Co., Ltd., and G. B. Ainsworth.

## PROCESS

### United States

21,901. (Reissue.) **Inflated Ball.** M. B. Reach, Springfield, Mass.

2,254,622. **Tire** Having Alternate Black and White Ribs. M. C. Overman, New York, N. Y.

2,254,741. **Making Heat Resisting Yarn and Cord** by Hydrating the Cellulose of the Yarns While Subjecting the Yarns to Sufficient Tension to Effect a Permanent Elongation Thereof. A. W. Hansen, Springfield, and W. F. Guinan, Northampton, both in Mass., assignors to United States Rubber Co., New York, N. Y., and Hampton Co., Easthampton, Mass.

2,255,772. **Manufacture of Tubular Rubber Articles** with a Glassy Smooth Inner Surface Finish, Which Comprises Coating the Inner Surface with Zinc Stearate, Closing at Least One End of the Tube to Prevent Air Circulation, and Curing the Rubber to Absorb the Zinc Stearate. E. L. Hanna, North Scituate, R. I., assignor to Davol Rubber Co., a corporation of R. I.

2,255,834. **Rubberizing Cellulose Fabrics** by Impregnating a Regenerated Cellulose with a Cation-Active Alkyl-Pyridinium Compound and Subsequently Applying a Rubber Thereto. J. I. Taylor and K. T. Schaefer, both of Elizabethton, Tenn., assignors to North American Rayon Corp., New York, N. Y.

2,256,159. **Rubber Hydrochloride Sipper.** F. J. Young, Kent, O., assignor to Wingfoot Corp., Wilmington, Del.

2,256,190. **Handling Chewing Gum.** J. W. Bowman, assignor, by mesne assignments, to William Steell Jackson & Son, a firm comprising W. S. and J. G. Jackson, all of Philadelphia, Pa.

2,256,194. **Adhesion of Rubber to Cotton** Which Comprises Applying to the Cotton a Shellac-Amine Soap, Associating the Treated Cotton with Vulcanizable Rubber, and Vulcanizing the Assemblage. R. A. Crawford, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,256,329. **Footwear** with Sponge Rubber Soles. A. Szerenyi and H. Rollmann, assignors, by mesne assignments, to H. Rollmann, all of Brussels, Belgium.

2,256,408. **Making Microporous Rubber Articles** by Admixing Latex and Compounding Ingredients, Including Vulcanizing Ingredients, Placing the Composition into a Mold, and Progressively Flocculating and Vulcanizing the Rubber While Prohibiting Substantial Escape of Water, the Vulcanization Being Effected Solely by Heat. E. G. Partridge, Stow, O., assignor to B. F. Goodrich Co., New York, N. Y.

### United Kingdom

537,818. **Perforated Films or Sheets.** International Latex Processes, Ltd.

538,329. **Inflated Hollow Articles.** Dunlop Rubber Co., Ltd., D. F. Twiss, and R. M. Everett.

538,475. **Rubber Hose.** B. O. N. Hansson.

538,852. **Molding a Shoe Sole.** P. A. Sperry.

## MACHINERY

### United States

2,254,203. **Apparatus for the Continuous Production of Sheets and Films** from Film-Forming Compositions Coagulable in a Liquid Coagulating Bath. W. Bender, Buffalo, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,254,233. **Apparatus to Form Vulcanized Articles.** A. Meyer, Harburg-Wilhelmsburg, Germany.

2,254,415. **Tire Cooker.** D. Boyd and H. E. Fenner, both of Eau Claire, Wis.

2,254,526. **Tire-Tread Shaping and Truing Machine.** P. E. Hawkinson, assignor to Paul E. Hawkinson Co., both of Minneapolis, Minn.

2,254,588. **Chuck** for Rotatably Supporting Tires. W. J. Breth, assignor to General Tire & Rubber Co., both of Akron, O.

2,254,596. **Tube Splicer.** W. J. Breth and M. L. Engler, assignors to General Tire & Rubber Co., all of Akron, O.

2,254,926. **Device to Support Tires** in Vulcanizers. J. H. Zimmerman, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,255,163. **Recapping Vulcanizer.** J. C. Heintz, Lakewood, O.

2,255,646. **Apparatus for Shaping and Bagging Tire Casings.** W. B. Brewer, C. L. Frost, and H. Karg, assignors to Master Tire & Rubber Corp., all of Findlay, O.

2,255,718. **Tire Groover.** J. Van Vorst, Frankfort, N. Y.

2,255,770. **Retreading Mold.** E. A. Glynn, assignor to Super Mold Corp. of California, both of Lodi, Calif.

2,256,150. **Twister Apparatus** and Method for Producing Elastic Yarn from Rubber Hydrochloride. G. D. Mallory, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,256,151. **Cutting, Stretching, and Twisting Apparatus.** R. C. Martin, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

### Dominion of Canada

398,468. **Skiving Machine.** Lyon-Vail Machine Co., Inc., Brockton, assignee of H. Lyon, Beverly, both in Mass., U. S. A.

398,748. **Continuous Wire Insulating Apparatus.** National Rubber Machinery Co., assignee of J. R. Stricklen, both of Akron, O., U. S. A.

398,839. **Pigment Mixer.** Canadian Industries, Ltd., Montreal, P. Q., assignee of M. A. Dibble, Toledo, O., and G. R. McCormick and R. G. Russell, both of Flint, Mich., co-inventors, all in the U. S. A.

398,950. **Tire Patch Cutter.** A. R. Hendry, Portland, Mich., U. S. A.

398,979. **Individual Mold Vulcanizer.** Akron Standard Mold Co., Akron, assignee of H. C. Bostwick, Coventry Township, both in O., U. S. A.

399,172. **Hydraulic Press Valve Mechanism.** Dominion Engineering Works, Ltd., Lachine, assignee of W. P. Muir, Montreal, and J. H. Maude, Verdun, co-inventors, all in P. Q.

399,237. **Tire Building Apparatus** with Circular Series of Tire-Building Machines on Which Operators Work Successively. Wingfoot Corp., Wilmington, Del., assignee of J. I. Haase, W. W. McMahan, and C. J. Roese, all of Akron, O., both in the U. S. A.

399,364. **Vulcanizing Press.** McNeil Machine & Engineering Co., assignee of L. E. Soderquist, both of Akron, O., U. S. A.

399,390. **Artificial Leather Making Apparatus.** Tufide Products Corp., assignee of H. A. Sheesley, both of Portland, Me., U. S. A.

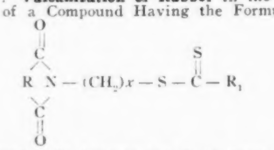
## United Kingdom

537,561. **Mold** for Footwear Having a Rubber Sole. M. Roca and E. Guix.
538,935. **Deposition Former** and Process for Making Rubber Bathing Suits. International Latex Processes, Ltd.
538,978. **Apparatus to Coat Wire, Etc.,** with Insulating Rubber or Similar Material. D. Bridge & Co., Ltd., (National Rubber Machinery Co.).

# CHEMICAL

## United States

2,254,267. **Preserving Latex** by Incorporating at Least 0.07% Ammonia, and a Water Soluble Penta Chlor Phenate in an Amount Sufficient to Provide an Effectively Preserved Latex. T. S. Carswell, Kirkwood, assignor to Monsanto Chemical Co., St. Louis, both in Mo.
2,254,321. **Making an Adhesive Cement** by Fusing Rubber, Rosin, and Pitch (Asphalt and Distillation Residue of Triglyceride-Containing Oils) at a Temperature above the Devulcanization and Depolymerization Temperature of Rubber, Homogeneously Mixing the Mass and Simultaneously Vulcanizing It with Sulphur until of Self-Sustaining Consistency, and Dispersing the Mass in a Volatile Solvent. S. G. Saunders, Bloomfield Hills, and H. Morrison, Detroit, assignors to Chrysler Corp., Highland Park, all in Mich.
2,254,572. **Production of Carbon Black** Which Comprises Burning under a Surface of Water a Combustible Premixture of Gas and Air, Introducing Hydrocarbon Gas into the Flame so as to Cause Cracking of the Gas, the Resultant Products of Combustion and Cracking Being Shock Cooled by the Water, Separating the Residual Gas from the Carbon Black by Bubbling the Gas up through the Water, and Separating the Carbon Black from the Water. F. J. Harlow, Bartlesville, Okla., assignor to Phillips Petroleum Co., a corporation of Del.
2,254,612. **Abrasive Mix** Consisting of Abrasive Granules Each Coated with Only Rubber as an Organic Bond with Sulphur and a Filler of Inert Material to the Extent of at Least 25% by Volume of the Bond (Rubber, Sulphur, and Filler). R. H. Martin, assignor to Norton Co., both of Worcester, Mass.
2,254,904. **Composition** Containing a Substance Selected from the Group Consisting of Cellulose Esters, Cellulose Ethers, Polyvinyl Esters, Polyvinyl Ethers, and Polymerized Alkyl Substituted Acrylic Acid Esters. W. H. Moss, London, England, assignor to Celanese Corp. of America, a corporation of Del.
2,255,386. **Antioxidant**—Product of Thermal Reaction with Elimination of Water of an N,N' Diaryl-Arylene-Diamine and an Aliphatic Alcohol of the Formula R(OH)$_n$ Where R Is an Aliphatic Hydrocarbon Group; O Is Oxygen; and *n* Is a Whole Number not Greater than 2. L. H. Howland, Nutley, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.
2,255,388. **Producing High Molecular Weight Polymers** by Fractionating Linear Iso-Olefin Polymer Substance. J. Kunc and F. L. Miller, both of Roselle Park, N. J., assignors to Standard Oil Development Co., a corporation of Del.
2,255,564. **Sheet-Coating Material** Comprising 20% by Weight of Wax and the Balance Composed Largely of a Condensation Derivative of Rubber Obtained by Treating Rubber In Solution with Chlorostannic Acid or a Halide of an Amphoteric Metal. E. Gebauer-Fuelnegg, deceased, late of Evanston, Ill., by M. Benedict, administratrix, Colorado Springs, Colo., and L. K. Eilers, Rochester, N. Y., and E. W. Moffett, Milwaukee, Wis., assignors, by mesne assignments, to Marbon Corp., a corporation of Del.
2,255,891. **Plastic** Comprising a Copolymer of an Incompletely Polymerized Chloroprene and a Synthetic Resin Which Acts to Reduce Controllably the Elongation or Stretch of the Chloroprene. J. N. Kuzmick, Passaic, and L. S. Hilton, Bloomfield, assignors to Raybestos-Manhattan, Inc., Passaic, all in N. J.
2,255,940. **Light Polarizing Material** Formed from a Transparent Plastic Sheet of Polyvinyl Alcohol or Polyvinyl Acetal. H. G. Rogers, West Newton, Mass., assignor to Polaroid Corp., Dover, Del.
2,256,148. **Preparing Copolymers** by Polymerizing a Mixture of at Least Two Monomers Each Containing an Ethylenic Linkage and at Least One Containing Conjugated Double Bonds in the Presence of a Chloropropionitrile. J. G. Lichty, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.
2,256,149. **Methyl Vinyl Ketone** Which Comprises Acetylating 3-Chlor-2-Butanone and Pyrolyzing the Resulting Product to Obtain the Methyl Vinyl Ketone. J. R. Long, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.
2,256,152. **Synthetic Resin**—the Product of the Conjoint Polymerization of Styrene and between about 0.1% and about 5.0% by Weight of 2-Methyl Acrolein. H. S. Nutting and P. S. Petrie, assignors to Dow Chemical Co., all of Midland, Mich.
2,256,153. **Tire** Having Embodied Therein Cords Made up of a Core of Rayon Fibers, Said Core Being Coated with a Casein-Latex Mixture Containing an Age Resister Which Promotes Continued Adhesion between Rayon Cord and Rubber. T. A. Riehl, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.
2,256,157. **Vulcanization of Rubber** in the Presence of a Compound Having the Formula



in Which *R* Is Arylene and $R_1$ Is Furyl and *x* Is a Whole Number from One to Three Inclusive. G. W. Watt, Austin, Tex., assignor to Wingfoot Corp., Wilmington, Del.
2,256,189. **Antioxidant.** Compounds Selected from the Class Consisting of N-Phenyl-N'-Cyclohexyl-p-phenylene Diamine and N-Naphthyl-N'-Cyclohexyl-p-phenylene Diamine. M. Bögemann, Cologne-Mulheim, O. Bayer and R. Schröter, Leverkusen, Rhine, and H. Pohle, Cologne-Mulheim, all in Germany, assignors, by mesne assignments, to General Aniline & Film Corp., New York, N. Y.

## Dominion of Canada

398,840. **Process for the Manufacture of 1-Cyanobutadiene-1,3** Which Comprises Heating an Ester of Crotonaldehyde-cyanohydrin to Thermal Decomposition Temperature. Canadian Industries, Ltd., Montreal, P. Q., assignee of H. Gudgeon, Manchester, England.
398,869. **Synthetic Rubber-Like Material.** Process Comprises Polymerizing in Aqueous Emulsion a Mixture of 1-Cyanobutadiene-1,3, Butadiene-1,3, and a Polymerizable Material Selected from the Group Comprising Styrene, Methyl Methacrylate, and Acrylo Nitrile. Imperial Chemical Industries, Ltd., London, assignee of B. J. Habgood, E. Isaacs, and L. B. Morgan, all of Blackley, Manchester, all in England.
398,879. **Producing a Rubber Conversion Product** by Reacting Undissolved Rubber at about 125° C. in Liquid Phenol in the Presence of Hydrogen Chloride, the Phenol Being Present in at Least Approximately 75 to 100 Parts by Weight of Rubber. Marbon Corp., Gary, Ind., assignee of J. P. McKenzie, Calumet City, Ill., both in the U. S. A.
399,316. **Insulating Material** Containing Mica and a Cementing Agent Comprising a Polyvinylal Resin. Canadian General Electric Co., Ltd., Toronto, Ont., assignee of W. H. Miller, Fort Wayne, Ind., U. S. A.
399,338. **Providing a Rubber Article with a Matt Surface** Which Comprises Forming a Solution of a Resinous Substance (Polymerized Vinyl Compounds, Phenolic Resins, Colophony, or Shellac) in Alcohol, Adding Water, and Precipitating the Shellac in Finely Divided Form and Applying the Suspension to the Article. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of A. Niven, E. A. Murphy, and E. W. Madge, co-inventors, all of Birmingham, England.
399,414. **Metal Object Coating Process** Using Polyvinyl Chloride. I. G. Farbenindustrie, A.G., Frankfurt a.M., assignee of G. Wick and A. Iloff, co-inventors, both of Bitterfeld, all in Germany.

## United Kingdom

538,199. **Vulcanization of Rubber.** E. I. du Pont de Nemours & Co., Inc., and I. Williams.
538,351. **Treatment of Rubber.** United States Rubber Co.
538,505. **Artificial Dispersions of Rubber.** British Rubber Producers' Research Ass'n and C. M. Blow.
538,544. **Treatment of Rubber Latex.** C. L. Walsh and A. Newman.
538,624. **Manufacture of Sponge or Cellular Rubber.** P. Schidrowitz and R. M. Ungar.
538,922. **Synthetic Resinous Condensation Products, Etc.** British Rubber Producers' Research Ass'n and F. J. W. Popham.
538,983. **Heat and Corrosion Resistant Products** Made from Rubber, Etc. H. C. Heide, (Naamlooze Vennootschap Hollandsche Draad- and Kabelfabriek).
539,092. **Plasticizing Compositions of or Containing Rubber.** Dunlop Rubber Co., Ltd., D. F. Twiss, F. A. Jones, P. H. Amphlett, and A. E. T. Neale.

# UNCLASSIFIED

## United States

2,254,223. **Tire Deflation Indicator Switch.** C. W. Johnston, Newark, N. J.
2,254,318. **Traction Device.** L. O. E. Roessel, Chappaqua, N. Y.
2,254,655. **Automobile Tire Pressure Relief Valve.** E. Hollowell, Kansas City, Kans.
2,254,740. **Heat Resisting Tire Casing Cord.** A. W. Hansen, Springfield, and W. F. Guinan, Northampton, Mass., assignors to United States Rubber Co., New York, N. Y., and Hampton Co., Easthampton, Mass.
2,254,787. **Tractor Tire.** G. Aukland, Rantoul, Ill.
2,254,792. **Vessel Welding Method and Apparatus.** A. M. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.
2,254,974. **Tire Regrooving Tool.** E. Olson and E. S. Johnson, assignors to Triangle Tire & Battery Service, all of Chicago, Ill., a partnership.
2,255,146. **Valve Stem** for Inner Tubes. G. W. Becker, Silver Lake, assignor, by mesne assignments, to Dill Mfg. Co., Cleveland, both in O.
2,255,350. **Tire Cross Chain.** J. E. Devlin, Worcester, Mass.
2,255,563. **Rubber Band Shooter.** J. R. Heminger, Akron, O.

## Dominion of Canada

398,913 and 398,914. **Tire Inflating Device.** K. Brewster, Washington, D. C., assignee of C. W. Parker, Dobbs Ferry, N. Y., both in the U. S. A.
398,927. **Tire Pressure Indicator.** R. E. Walters and C. E. Ruch, co-inventors, both of Nappanee, Ind., U. S. A.
398,974. **Pencil Eraser Holder.** A. Scharf, Chicago, Ill., U. S. A.
399,081. **Tire Alarm.** W. L. Stoddard, Elgin, inventor, and A. H. Harkey, Fairbank, assignee of ½ of the interest, both in Ariz.

## United Kingdom

538,235. **Pressure-Reducing Valve or Device** for Use with Fluid-Pressure Systems or Apparatus. Dunlop Rubber Co., Ltd., and H. Trevaskis.
538,462. **Valves** for Pneumatic-Type Tubes. Dunlop Rubber Co., Ltd.
538,549. **Valve Stems** for Inner Tubes. United States Rubber Co.

# TRADE MARKS

## United States

389,359. **Synplastic.** Hose. Whitehead Bros. Rubber Co., Trenton, N. J.
389,366. **Koroplate.** Protective paint coating of synthetic resin. B. F. Goodrich Co., New York, N. Y.
389,367. Representation of a sailboat on waves and the word: **"Corylin."** Shower curtains. Royal Maid Mfg. Co., Chicago, Ill.
389,408. **Conductex.** Furnace black. Binney & Smith Co., New York, N. Y.
389,476. **"Bra-Setall."** Foundation garments, etc. Venus Foundation Garments, Inc., Chicago, Ill.
389,496. **Mercury.** Heels and soles. Goodyear Tire & Rubber Co., Akron, O.
389,503. **Charter.** Tires. Gates Rubber Co., Denver, Colo.
389,506. **Travel-Air.** Tires. National Tire Stores, Inc., Denver, Colo.
389,541. **Arco.** Rubber bands. W. H. Spencer, doing business as Alliance Rubber Co., Alliance, O.
389,555. **Arhco.** Radio and television hardware. American Radio Hardware Co., Inc., New York, N. Y.
389,601. **Cornelian.** Tires and inner tubes. The Pep Boys—Manny, Moe & Jack, Philadelphia, Pa.
389,674. Representation of an oval containing the words: **"Mardi Gras"**; each letter of the words contained in a circle. Foundation garments, etc. Snug-Fit Foundations, Inc., New York, N. Y.
389,712. **Synplastic.** Boots. Goodall Rubber Co., Inc., Philadelphia, Pa.
389,719. Representation of a mixing bowl between the words: **"Mixing Bowl."** Sportswear, including bathing hats. B. Lowenstein & Bros., Inc., Memphis, Tenn.
389,747. Representation of a child and a fanciful label containing the words: **"Sleepy-Time Slippers."** Footwear. S. Goldberg Co., Inc., Hackensack, N. J.
389,937. **Vulkseal.** Compounded rubber preparation used in making and repairing tires. Oliver Tire & Rubber Co., Oakland, Calif.

# Market Reviews

## CRUDE RUBBER

### Commodity Exchange

TABULATED WEEK-END CLOSING PRICES ON THE NEW YORK MARKET

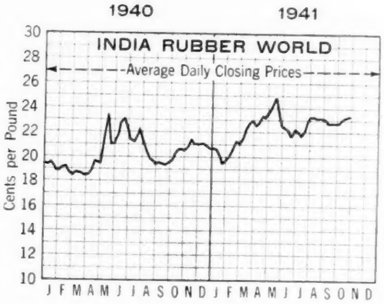
| Futures | Aug. 13 | Sept. 27 | Oct. 4 | Oct. 11 | Oct. 18 | Oct. 25 |
|---|---|---|---|---|---|---|
| Dec. .... | 22.41 | 22.45 | 22.45 | 22.50 | 22.50 | 22.50 |
| Jan. .... | ..... | 22.25 | 22.25 | 22.30 | 22.40 | 22.35 |
| Mar. .... | 21.30 | 22.10 | 22.30 | 22.40 | 22.35 | 22.35 |
| Volume per week (tons) . | 1,310 | 550 | 520 | 480 | 300 | 80 |

THE rubber futures market continued last month in the state of quietude which has characterized it since September 15, the day on which trading was resumed. After 644 open contracts were liquidated on the opening date the closing of open contracts proceeded slowly and somewhat spasmodically. There were 77 open contracts on October 27, against 1,053 open lots on September 15.

The inactivity of the futures market was shown last month by January futures which advanced slowly and regularly. The closing price of September 30, 22.25¢ per pound, increased to 22.40¢ per pound on October 14 and then declined to close at 22.35¢ per pound on October 28.

As a direct result of the curtailment program, crude rubber consumption continues to taper off, and the September figure, 53,655 long tons, compares with the figure of 50,702 tons initially set by the OPM before any provision for individual concessions. According to the program, October consumption should be nearly 3,000 tons below that of September.

According to the International Rubber Regulation Committee crude rubber exports in July from countries participating in the restriction plan amounted to




New York Outside Market—Spot No. 1-X Ribbed Smoked Sheets

129,863 long tons, against 121,181 long tons (revised) in June, and world net exports amounted to 133,116 long tons in July, against 124,691 long tons in June. Permissible exports for July were 124,917 long tons (excluding Thailand). World absorption of crude rubber totaled 103,153 long tons in July, against 114,912 long tons in June. Total world exports for the first seven months of the year were placed at 879,126 long tons, of which 65.3% (574,296 long tons) were imported into the United States. Absorption outside the United States and the United Kingdom rose from 17,500 long tons in June to 22,000 long tons in July (both figures estimated). The Commodity Exchange, Inc., suggests that the rise of 4,500 long tons may be caused by exports to Russia.

Of the 217,462,062 pounds of rubber imported during July, including latex, concentrates, and guayule, 35,211,161 pounds, or 16.3%, entered through the customs districts of Los Angeles and San Francisco, against 16.6% during June and 9.4% during May, according to the U. S. Department of Commerce.

### New York Outside Market Rubber Quotations

| Latex | Oct. 28, 1940 | Sept. 25, 1941 | Oct. 28, 1941 |
|---|---|---|---|
| | (Dollars and Cents) | | |
| Normal and concentrated (solid content) ....*lb.* | .2469/.25 | .2755/.29 | .2825/.295 |
| **Paras** | | | |
| Upriver fine....*lb.* | .16¾ | .29 | .29 |
| Upriver fine....*lb* | *.19¾ | *.31½ | *.32½ |
| Upriver coarse.*lb.* | .11½ | .15 | .16 |
| Upriver coarse.*lb* | *.17 | *.22 | *.22 |
| Islands fine....*lb.* | .16 | .28 | .29 |
| Islands fine....*lb.* | *.19 | *.30 | *.32 |
| Acre, Bolivian fine ........*lb.* | .17 | .29½ | .29¼ |
| Acre, Bolivian fine ........*lb.* | *.20 | *.32 | *.33 |
| Beni, Bolivian fine ........*lb.* | .18 | .30½ | .30 |
| Madeira fine...*lb.* | .16¾ | .29 | .30 |
| **Caucho** | | | |
| Upper ball.....*lb.* | .11½ | .15 | .16 |
| Upper ball.....*lb.* | *.17 | *.22 | *.22 |
| Lower ball.....*lb.* | .10½ | .14 | .15½ |
| **Pontianak** | | | |
| Pressed block..*lb.* | .15/20 | .22/.29 | .22/.30 |
| **Guayule** | | | |
| Ampar .......*lb.* | .15½ | .16½ | .... |
| **Africans** | | | |
| Rio Nuñez .. *lb.* | .18½ | .18 | .18 |
| Black Kassai...*lb.* | .18½ | .18 | .18 |
| Prime Niger flake ........*lb.* | .22½ | .28 | .28 |
| **Gutta Percha** | | | |
| Gutta Siak ....*lb* | .16 | .25 | .24 |
| Gutta Soh .....*lb.* | .24 | .29 | .30 |
| Red Macassar..*lb* | 1.20 | 1.35 | 1.35 |
| **Balata** | | | |
| Block Ciudad Bolivar .....*lb.* | .45 | .47 | .48 |
| Manaos block..*lb.* | .50 | .47 | .47 |
| Surinam sheets.*lb.* | .47 | .50 | .48 |
| Amber .....*lb.* | .49 | .52 | .50 |

* Washed and dried crepe. Shipments from Brazil.

### New York Outside Market

As free rubber grew more scarce daily, dealers became anxious to obtain stocks to meet previous commitments, and their bidding forced the price up to 23¼¢ per pound although government rubber was available at 22½¢ per pound plus costs. Consumers at first showed little interest in purchasing stocks from

## New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

| | Sept. 22, 1941 | 23 | 24 | 25 | 26 | 27† | 29 | 30 | Oct. 1, 1941 | 2 | 3 | 4† | 6 | 7 | 8 | 9 | 10 | 11† | 13* | 14‡ | 15 | 16 | 17 | 18† |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1-X R.S.S. in cases ... | 22¾ | 22¾ | 22¾ | 22¾ | 22¾ | .. | 22¾ | 22¾ | 22¾ | 22¾ | 22¾ | .. | 22¾ | 23 | 23¼ | 23¼ | 23¼ | .. | .. | 22½ | 22½ | 22½ | 22½ | .. |
| No. 1 Thin Latex Crepe.... | 24⅛ | 24⅛ | 24⅛ | 24⅛ | 24⅛ | .. | 24⅛ | 24⅛ | 24⅛ | 24⅛ | 24⅛ | .. | 24⅛ | 24½ | 24¾ | 24¾ | 24¾ | .. | .. | 23 5/16 | 23 5/16 | 23 5/16 | 23 5/16 | .. |
| No. 2 Thick Latex Crepe... | 24⅛ | 24⅛ | 24⅛ | 24⅛ | 24⅛ | .. | 24⅛ | 24⅛ | 24⅛ | 24⅛ | 24⅛ | .. | 24⅛ | 24½ | 24¾ | 24¾ | 24¾ | .. | .. | 23 5/16 | 23 5/16 | 23 5/16 | 23 5/16 | .. |
| No. 1 Brown Crepe........ | 21¼ | 21¼ | 21¼ | 21¼ | 21¼ | .. | 21¼ | 21¼ | 21¼ | 21¼ | 21⅛ | .. | 21¼ | 21½ | 21¾ | 21¾ | 21¾ | .. | .. | 21⅜ | 21⅜ | 21⅜ | 21⅜ | .. |
| No. 2 Brown Crepe........ | 21 | 21 | 21 | 21 | 21 | .. | 21 | 21 | 21 | 21 | 21 | .. | 21 | 21¼ | 21½ | 21½ | 21½ | .. | .. | 21 1/16 | 21 1/16 | 21 1/16 | 21 1/16 | .. |
| No. 2 Amber ............. | 21¼ | 21¼ | 21¼ | 21¼ | 21¼ | .. | 21¼ | 21¼ | 21¼ | 21¼ | 21⅛ | .. | 21¼ | 21½ | 21¾ | 21¾ | 21¾ | .. | .. | 21⅜ | 21⅜ | 21⅜ | 21⅜ | .. |
| No. 3 Amber ............. | 21 | 21 | 21 | 21 | 21 | .. | 21 | 21 | 21 | 21 | 21 | .. | 21 | 21¼ | 21½ | 21½ | 21½ | .. | .. | 21 1/16 | 21 1/16 | 21 1/16 | 21 1/16 | .. |
| Rolled Brown ............ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | .. | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | .. | 18¾ | 19⅛ | 19¼ | 19¼ | 19¼ | .. | .. | 17 15/16 | 17 15/16 | 17 15/16 | 17 15/16 | .. |

## New York Outside Market (Continued)

| | Oct. 20, 1941 | 21 | 22 | 23 | 24 | 25† |
|---|---|---|---|---|---|---|
| No. 1-X R.S.S. in cases.................. | 22½ | 22½ | 22½ | 22½ | 22½ | .. |
| No. 1 Thin Latex Crepe.................. | 23 5/16 | 23 5/16 | 23 5/16 | 23 5/16 | 23 5/16 | .. |
| No. 2 Thick Latex Crepe.................. | 23 5/16 | 23 5/16 | 23 5/16 | 23 5/16 | 23 5/16 | .. |
| No. 1 Brown Crepe.................. | 21⅜ | 21⅜ | 21⅜ | 21⅜ | 21⅜ | .. |
| No. 2 Brown Crepe.................. | 21 1/16 | 21 1/16 | 21 1/16 | 21 1/16 | 21 1/16 | .. |
| No. 2 Amber.................. | 21⅜ | 21⅜ | 21⅜ | 21⅜ | 21⅜ | .. |
| No. 3 Amber.................. | 21 1/16 | 21 1/16 | 21 1/16 | 21 1/16 | 21 1/16 | .. |
| Rolled Brown.................. | 17 15/16 | 17 15/16 | 17 15/16 | 17 15/16 | 17 15/16 | .. |

* Holiday. †Closed. ‡Prices from Oct. 14 to 25 are based on government-owned rubber; free rubber price on 1-X R.S.S. 23¼¢ per lb.

## Rubber Trade Inquiries

*The inquiries below are of interest not only in showing the needs of the trade, but because additional information may be furnished by readers. The Editor is glad to have those interested communicate with him.*

| No. | Inquiry |
|---|---|
| 2853 | Manufacturers of molds for rubber toys. |
| 2854 | Manufacturers of rubber toys. |
| 2855 | Suppliers of fossil flour. |
| 2856 | Manufacturers of belts for sewing machines. |
| 2857 | Manufacturers of men's shoe forms. |
| 2858 | Manufacturers of colored sheet sponge rubber. |
| 2859 | Manufacturers of rubber rings for cream separators. |
| 2860 | Manufacturers of printing inks for balloons. |

the Rubber Reserve Co. even though off-grade differentials data have been announced, and many manufacturers are said to prefer to work down their inventories before buying rubber. Government rubber, however, is gradually coming into more use although it is understood that free rubber will be available in progressively smaller amounts until the early part of 1942. Dealers and importers are curious as to whether rubber conservation will continue next year on the present basis and as to the amount of emergency supplies contemplated by the Administration.

Some indication of the success of government control of rubber prices was seen when the market failed to react to change in the Japanese cabinet last month.

The price of No. 1-X ribbed smoked sheets, after registering no advances or declines since September 4, advanced from 22¾¢ per pound to 23¼¢ per pound on October 9. Thereafter the market advanced, and the price closed at 23⅜¢ per pound October 28.

## RUBBER SCRAP

THE demand for rubber scrap continues heavy, with reclaimers continuing operations at capacity levels. Collections were reported better during October, and the large dealers are making every effort to maintain an increasing flow of scrap rubber, going into remote districts to obtain material.

The market is steady, and the quotations on all grades are unchanged from last month's levels, except for No. 2 compound and red inner tubes, which advanced somewhat. It is reported that large dealers are making a vigorous attempt to maintain a stabilized price structure in the scrap rubber market.

### Consumers' Buying Prices

(Carlot Lots for October 23, 1941)

| | | Prices |
|---|---|---|
| **Boots and Shoes** | | |
| Boots and shoes, black | *lb.* | $0.01⅝/$0.01¾ |
| Colored | *lb.* | .01⅜/ .014½ |
| Untrimmed arctics | *lb.* | .01¼/ .01⅜ |
| **Inner Tubes** | | |
| No. 1, floating | *lb.* | .12 / .14 |
| No. 2, compound | *lb.* | .07½/ .07¾ |
| Red | *lb* | .07⅝/ .07¾ |
| Mixed tubes | *lb.* | .06⅜/ .06⅝ |
| **Tires (Akron District)** | | |
| Pneumatic Standard | | |
| Mixed auto tires with beads | *ton* | 17.50 /18.50 |
| Beadless | *ton* | 23.50 /24.00 |
| Auto tire carcass | *ton* | 55.00 /60.00 |
| Black auto peelings | *ton* | 54.00 /55.00 |
| Solid | | |
| Clean mixed truck | *ton* | 40.00 /44.00 |
| Light gravity | *ton* | 50.00 /52.00 |
| **Mechanicals** | | |
| Mixed black scrap | *ton* | 33.00 /34.00 |
| Hose, air brake | *ton* | 29.00 /30.00 |
| Garden, rubber covered | *ton* | 12.00 /14.00 |
| Steam and water, soft | *ton* | 12.00 /14.00 |
| No. 1 red | *lb.* | .04¾/ .05 |
| No. 2 red | *lb.* | .03½/ .04 |
| White druggists' sundries | *lb.* | .04 / .04½ |
| Mixed mechanicals | *lb.* | .02¾/ .03 |
| White mechanicals | *lb.* | .04¼/ .04½ |
| **Hard Rubber** | | |
| No. 1 hard rubber | *lb.* | .16 / .17 |

## IMPORTS, CONSUMPTION, AND STOCKS

### United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks—Long Tons

| Twelve Months | U.S. Imports* | U.S. Consumption¶ | U.S. Stocks Mfrs., Dealers, Importers, Etc.†¶ | U.S. Stocks Afloat | U.K.—Public Warehouses London, Liverpool†‡ | Singapore and Penang Dealers and Port Stocks†‡ | World Net Exports‡ | World Absorption‡c | World Stocks†‡§ |
|---|---|---|---|---|---|---|---|---|---|
| 1939 | 499,616 | 592,000 | 125,800 | 91,095 | 44,917a | 15,299 | 988,600 | 1,112,383 | 447,666a |
| 1940 | 818,624 | 648,500 | 288,864 | 145,950 | ...... | 26,773 | 1,392,586 | 1,099,564 | ....... |
| 1941 | | | | | | | | | |
| Jan. | 86,833 | 65,989 | 309,411b | 153,169b | ...... | 37,145 | 151,060 | 101,829 | ....... |
| Feb. | 73,973 | 62,692 | 320,372b | 136,955b | ...... | 46,913 | 97,522 | 90,016 | ....... |
| Mar. | 87,123 | 69,024 | 338,147b | 140,228b | ...... | 41,005 | 130,395 | 104,790 | ....... |
| Apr. | 63,305 | 71,374 | 329,767b | 153,484b | ...... | 42,085 | 119,855 | 103,151 | ....... |
| May | 101,404 | 71,365 | 359,234b | 147,454b | ...... | 44,610 | 122,487 | 99,943 | ....... |
| June | 64,577 | 84,912 | 339,108b | 175,499b | ...... | 43,263 | 124,691 | 116,112 | ....... |
| July | 97,081 | 68,653 | 395,216b | 132,304b | ...... | 41,534 | 133,116 | 104,353 | ....... |
| Aug. | 106,539 | 55,365 | 446,008b | 90,591b | ...... | ...... | ...... | ...... | ....... |
| Sept. | 81,743 | 53,655 | 473,684b | 139,784b | ...... | ...... | ...... | ...... | ....... |

*Including liquid latex. †Stocks on hand the last of the month or year. ‡*Statistical Bulletin of the International Rubber Regulation Committee.* §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, regulated areas, and afloat. ¶Corrected to 100% from estimate of reported coverage. *a*Stocks as of Aug. 31, 1939. *b*Includes government emergency rubber. *c*Including producing countries.

### Tire Production Statistics

| | Pneumatic Casings | | |
|---|---|---|---|
| | Inventory | Production | Shipments |
| 1939 | 8,664,505 | 57,612,731 | 57,508,775 |
| 1940 | 9,126,528 | 59,186,423 | 58,774,437 |
| 1941 | | | |
| Jan. | 9,797,253 | 5,486,296 | 4,849,748 |
| Feb. | 10,028,803 | 5,161,267 | 4,896,340 |
| Mar. | 10,148,861 | 5,685,559 | 5,517,255 |
| Apr. | 9,957,849 | 5,839,332 | 5,999,262 |
| May | 8,373,324 | 6,091,395 | 7,675,828 |
| June | 7,087,737 | 6,378,844 | 7,601,993 |
| July | 6,234,749 | 5,603,064 | 6,455,803 |
| Aug. | 5,834,109 | 5,004,912 | 5,399,702 |
| Sept. | 5,170,008 | 4,583,324 | 5,264,357 |

| | Pneumatic Casings | | |
|---|---|---|---|
| | Original Equipment | Replacement Sales | Export Sales |
| 1939 | 18,207,556 | 38,022,034 | 1,279,185 |
| 1940 | 22,252,869 | 35,345,656 | 1,175,912 |
| 1941 | | | |
| Jan. | 2,291,209 | 2,424,730 | 133,809 |
| Feb. | 2,546,120 | 2,203,297 | 146,923 |
| Mar. | 2,638,066 | 2,728,557 | 150,632 |
| Apr. | 2,332,427 | 3,534,323 | 132,512 |
| May | 2,698,799 | 4,830,449 | 146,580 |
| June | 2,595,259 | 4,861,281 | 145,453 |
| July | 2,000,244 | 4,316,438 | 139,121 |
| Aug. | 1,123,057 | 4,146,000 | 130,645 |
| Sept. | 1,470,286 | 3,667,461 | 126,610 |

| | Inner Tubes | | |
|---|---|---|---|
| | Inventory | Production | Shipments |
| 1939 | 7,035,671 | 50,648,556 | 51,190,314 |
| 1940 | 7,016,948 | 52,237,003 | 52,214,079 |
| 1941 | | | |
| Jan. | 7,632,655 | 5,112,824 | 4,473,942 |
| Feb. | 7,924,383 | 4,887,190 | 4,610,313 |
| Mar. | 8,068,646 | 5,349,202 | 5,181,198 |
| Apr. | 8,142,692 | 5,480,933 | 5,358,351 |
| May | 7,686,194 | 5,839,405 | 6,310,202 |
| June | 7,010,100 | 6,263,876 | 6,908,434 |
| July | 6,356,726 | 5,287,883 | 5,920,072 |
| Aug. | 6,071,075 | 4,443,918 | 4,782,678 |
| Sept. | 5,466,818 | 4,151,852 | 4,796,024 |

| | Inner Tubes | | |
|---|---|---|---|
| | Original Equipment | Replacement Sales | Export Sales |
| 1939 | 18,190,630 | 31,997,906 | 1,001,778 |
| 1940 | 22,172,452 | 29,069,547 | 972,080 |
| 1941 | | | |
| Jan. | 2,281,274 | 2,082,311 | 110,357 |
| Feb. | 2,545,877 | 1,932,703 | 131,733 |
| Mar. | 2,647,533 | 2,405,927 | 127,738 |
| Apr. | 2,334,612 | 2,908,490 | 115,249 |
| May | 2,686,450 | 3,496,860 | 126,892 |
| June | 2,590,029 | 4,205,944 | 112,461 |
| July | 2,006,215 | 3,806,701 | 107,156 |
| Aug. | 1,114,962 | 3,555,159 | 112,557 |
| Sept. | 1,460,273 | 3,237,968 | 97,783 |

Source: The Rubber Manufacturers Association, Inc. Figures adjusted to represent 100% of the industry.

SEPTEMBER crude rubber consumption by domestic rubber manufacturers was 53,655 long tons, 3.1% under that of August, but 2.3% above that of September, 1940, the R.M.A. reports.

Gross imports for September totaled 81,743 long tons, according to the United States Department of Commerce, 23.3% under August, (revised), but 3.5% over September, 1940, and includes 330 tons of guayule and 3,252 tons of latex, the highest latex imports since December, 1940. The average declared import value was 18.75¢, against 19.09¢ in August.

Total domestic stocks, including government reserves, totaled 473,684 long tons on September 30, 6.2% above August 31 stocks and 115% over the stocks estimated for September 30, 1940.

Stocks in the hands of the United States Government, September 30, were 243,251 long tons, up 14,700 tons above August, leaving 67,043 tons available to the trade from September imports.

Stocks afloat for U. S. ports September 30 were 139,784 long tons.

### Reddish Orange Pigment

BRIGHT shades of reddish orange possessing good fastness to light are said to result when Vulcan Fast Orange GRN Powder, a pure organic pigment, is incorporated in rubber mixes. The product, manufactured by General Dyestuff Corp., reportedly does not migrate in rubber and is fast to vulcanization in the press or in open steam.

### United States Latex Imports

| Year | Pounds (d.r.c.) | Value |
|---|---|---|
| 1939 | 61,460,003 | $10,467,552 |
| 1940 | 75,315,775 | 14,543,975 |
| 1941 | | |
| Jan. | 4,892,860 | 1,019,741 |
| Feb. | 6,598,930 | 1,279,648 |
| Mar. | 3,822,583 | 774,225 |
| Apr. | 3,570,742 | 648,217 |
| May | 5,895,381 | 1,117,226 |
| June | 4,637,095 | 936,944 |
| July | 4,589,007 | 930,126 |

*Data from United States Department of Commerce, Washington, D. C.*

# COMPOUNDING INGREDIENTS

THE demand for compounding ingredients in general continued heavy during the past month. While the rubber curtailment program has not affected many of the materials on the market, there has been reported some slackening in the domestic demand for carbon black and rubber solvents. Prices are firm, with advances noted in certain cases.

CARBON BLACK. Some let-up in the domestic demand for carbon black was noted in October under the impact of rubber restriction, but it was reported that this trend was being offset to some extent by the use of relatively larger percentages of black in defense goods. Also during the past few months exports have increased to the United Kingdom through the lease-lend program and to Russia through purchases. Shipping facilities appear to be the most important deterrent to increased exports.

Stocks increased during September by 2,000,000 pounds to total 127,000,000 pounds; while production remained constant at 41,000,00 pounds per month. Prices are steady and unchanged.

FACTICE. While demand remains very steady, prices of most grades have advanced because of the increased costs of imported and domestic vegetable oils.

LITHARGE. Demand is heavy, tending to exceed available supply. Exports during the first seven months were placed at 3,059,800 pounds, 102% above exports during the corresponding period of 1940. Prices are firm.

LITHOPONE. The market continued tight with supplies being allocated and contract customers receiving preference. Exports during the first seven months were placed at 28,446,500 pounds, 69.5% above exports during the same period last year. Prices are unchanged.

RUBBER CHEMICALS. Unaffected by government curtailment of crude rubber, demand continued at a high level last month. According to reports, producers feel that supplies will be sufficient to handle all demands on the basis of current rubber allocations. However it is reported that shortages in some of the raw materials required for the manufacture of some of the important rubber chemicals has caused some dislocation which has resulted in increased sales of those products that are more freely available. It is believed that the increased use of reclaim may further increase the demand for antioxidants. Although some slight advances have been registered, there has been no general change in prices.

RUBBER SOLVENTS. Demand continues satisfactory although consumption by the rubber industry slackened somewhat in the latter half of October. Prices remain the same.

TITANIUM PIGMENTS. Civilian consumption is being progressively curtailed as the market receives an increase of priority orders. Exports during the first seven months were placed at 10,013,500 pounds, 70.4% above exports during the 1940 period. Prices are steady.

ZINC OXIDES. Demand continues heavy, exceeding supply and creating a backlog of orders. Exports during the first seven months totaled 8,112,000 pounds, 91.5% above exports during the same period of 1940. The OPM announced on September 26 that producers would not be required to set aside any part of their production for October use. The market is firm, with the indication that prices should move higher at the end of this year.

## Current Quotations*

### Abrasives

| | | |
|---|---|---|
| Pumicestone, powdered | *lb.* | $0.04 / $0.045 |
| Rottenstone, domestic | *lb.* | .025 / .03 |

### Accelerators, Inorganic

| | | |
|---|---|---|
| Lime, hydrated, *l.c.l.*, New York | *ton* | 25.00 |
| Litharge (commercial) | *lb.* | .0825 / .09 |

### Accelerators, Organic

| | | |
|---|---|---|
| A-1 | *lb.* | .26 / .35 |
| A-10 | *lb.* | .34 / .40 |
| A-19 | *lb.* | .52 / .65 |
| A-32 | *lb.* | .70 / .80 |
| A-77 | *lb.* | .42 / .55 |
| A-100 | *lb.* | .42 / .55 |
| Accelerator 49 | *lb.* | .41 / .42 |
| 531 | *lb.* | .48 / .50 |
| 737 | *lb.* | .42 / .43 |
| 737-50 | *lb.* | .25 / .26 |
| 808 | *lb.* | .70 / .72 |
| 833 | *lb.* | 1.15 |
| Acrin | *lb.* | .60 |
| Aldehyde ammonia | *lb.* | .65 / .70 |
| Altax | *lb.* | .55 / .60 |
| B-J-F | *lb.* | .50 / .55 |
| Beutene | *lb.* | .70 / .75 |
| Butyl Eight | *lb.* | .98 / 1.00 |
| C-P-B | *lb.* | 2.00 |
| Captax | *lb.* | .50 |
| Crylene | *lb.* | |
| Paste | *lb.* | |
| D-B-A | *lb.* | 2.00 |
| Delac A | *lb.* | .40 / .50 |
| O | *lb.* | .40 / .50 |
| P | *lb.* | .40 / .50 |
| Di-Esterex-N | *lb.* | .60 / .70 |
| DOTG (Di-ortho-tolyguanidine) | *lb.* | .44 / .46 |
| DPG (Diphenylguanidine) | *lb.* | .35 / .45 |
| El-Sixty | *lb.* | .50 / .65 |
| Ethylideneaniline | *lb.* | .42 / .43 |
| Formaldehyde P.A.C | *lb.* | .06 |
| Formaldehyde-para-toluidine | *lb.* | .57 / .59 |
| Formaniline | *lb.* | .36 / .37 |
| Guantal | *lb.* | .40 / .50 |
| Hepteen | *lb.* | .35 / .40 |
| Base | *lb.* | 1.35 / 1.50 |
| Hexamethylenetetramine U.S.P. | *lb.* | .39 |
| Technical | *lb.* | .33 |
| Lead oleate, No. 999 | *lb.* | .145 |
| Witco | *lb.* | .15 |
| Ledate | *lb.* | 1.50 |
| Monex | *lb.* | 1.55 |
| Novex | *lb.* | |
| O-X-A-F | *lb.* | .50 / .55 |
| Oxynone | *lb.* | .77 / .90 |
| Para-nitroso-dimethylaniline | *lb.* | .85 |
| Pentex | *lb.* | .75 / .85 |
| Flour | *lb.* | .125 / .135 |
| O | *lb.* | |
| Flour | *lb.* | |
| Phenex | *lb.* | .50 / .55 |
| Pip-Pip | *lb.* | 1.90 |
| R & H 50-D | *lb.* | .42 / .43 |
| Rotax | *lb.* | .60 / .65 |
| Safex | *lb.* | 1.20 / 1.30 |
| Santocure | *lb.* | .80 / 1.00 |
| Selenac | *lb.* | 2.00 |
| SPDX | *lb.* | .70 / .75 |
| A | *lb.* | .70 / .75 |
| Super sulphur No. 2 | *lb.* | .14 / .16 |
| Tetrone A | *lb.* | 2.20 |
| Thiocarbanilide | *lb.* | .26 / .35 |
| Thionex | *lb.* | 1.75 |
| Thiurad | *lb.* | 1.55 |
| Trimene | *lb.* | .55 / 65 |
| Base | *lb.* | 1.05 / 1.20 |
| Triphenylguanidine (TPG) | *lb.* | .45 |
| Tuads, Methyl | *lb.* | 1.55 |
| 2-MT | *lb.* | .54 |
| Ulto | *lb.* | 1.25 / 1.50 |
| Ureka | *lb.* | .60 / .75 |
| Blend B | *lb.* | .60 / .75 |
| C | *lb.* | .56 / .65 |

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of known ingredients. Requests for information not recorded will receive prompt attention.

| | | |
|---|---|---|
| Vulcanex | *lb* | $0.42 / $0.43 |
| Vulcanol | *lb.* | .85 |
| Z-B-X | *lb.* | 2.50 |
| Zenite | *lb.* | .46 / .48 |
| A | *lb.* | .53 / .55 |
| B | *lb.* | .46 / .48 |
| Zimate, Butyl | *lb.* | 1.15 |
| Ethyl | *lb.* | 1.15 |
| Methyl | *lb.* | 1.25 |

### Activators

| | | |
|---|---|---|
| Aero Ac 50 | *lb.* | .46 / .52 |
| Barak | *lb.* | .50 |
| MODX | *lb.* | .30 / .35 |
| SL No. 20 | *lb.* | .085 / .10 |

### Age Resisters

| | | |
|---|---|---|
| AgeRite Alba | *lb.* | 2.00 |
| Gel | *lb.* | .57 / .59 |
| Hipar | *lb* | .65 / .67 |
| Powder | *lb.* | .52 / .54 |
| Resin | *lb.* | .52 / .54 |
| D | *lb.* | .52 / .54 |
| White | *lb.* | 1.25 / 1.40 |
| Akroflex C | *lb.* | .56 / .58 |
| Albasan | *lb.* | .70 / .75 |
| Aminox | *lb.* | .52 / .61 |
| Antox | *lb.* | .56 |
| Betanox | *lb.* | .52 / .61 |
| Special | *lb.* | .65 / .74 |
| B-L-E | *lb.* | 52. / .61 |
| Powder | *lb.* | .65 / .74 |
| B-X-A | *lb.* | .52 / .61 |
| Copper Inhibitor X-872-A | *lb.* | 1.15 |
| Flectol B | *lb.* | .52 / .65 |
| H | *lb.* | .52 / .65 |
| White | *lb.* | .90 / 1.15 |
| M-U-F | *lb.* | 1.50 |
| Neozone (standard) | *lb.* | .63 |
| A | *lb.* | .52 / .54 |
| B | *lb.* | .63 |
| C | *lb.* | .52 / .54 |
| D | *lb.* | .52 / .54 |
| E | *lb.* | .63 |
| Oxynone | *lb.* | .77 / .90 |
| Parazone | *lb.* | .68 |
| Permalux | *lb.* | 1.20 |
| Santoflex B | *lb.* | .52 / 65 |
| BX | *lb.* | .58 / .71 |
| Santovar A | *lb.* | 1.15 / 1.40 |
| Solux | *lb.* | 1.30 |
| Stabilite | *lb.* | .52 / .54 |
| Alba | *lb.* | .70 / .75 |
| Thermoflex | *lb.* | 1.20 / 1.15 |
| A | *lb.* | .65 / .67 |
| Tysonite | *lb.* | .16 / .165 |
| V-G-B | *lb.* | .52 / .61 |

### Alkalies

| | | |
|---|---|---|
| Caustic soda, flake, Columbia (400-*lb. drums*) | 100 *lbs.* | 2.70 / 3.55 |
| liquid, 50% | 100 *lbs.* | 1.95 |
| solid (700-*lb. drums*) | 100 *lbs.* | 2.30 / 3.15 |

### Antiscorch Materials

| | | |
|---|---|---|
| A-F-B | *lb.* | .35 / .40 |
| Antiscorch T | *lb.* | .90 |
| Cumar RH | *lb.* | .105 |
| E-S-E-N | *lb.* | .35 / .40 |
| R-17 Resin (*drums*) | *lb.* | .105 |
| RM | *lb.* | 1.25 |
| Retarder W | *lb.* | .36 |
| Retardex | *lb.* | .45 / .48 |
| U-T-B | *lb.* | .35 / .40 |

### Antiseptics

| | | |
|---|---|---|
| Compound G-4 | *lb.* | |
| G-11 | *lb.* | |

### Antisun Materials

| | | |
|---|---|---|
| Heliozone | *lb.* | .23 / .24 |
| S.C.R. | *lb.* | .33 / .35 |
| Sunproof | *lb.* | .23 / .28 |
| Jr. | *lb.* | .165 / .215 |

### Blowing Agents

| | | |
|---|---|---|
| Ammonium Carbonate, lumps (500-*lb. drums*) | *lb.* | |
| Unicel | *lb.* | .50 |

### Brake Lining Saturant

| | | |
|---|---|---|
| B.R.T. No. 3 | *lb.* | .0175 / .0185 |

### Colors

#### Black

| | | |
|---|---|---|
| Du Pont powder | *lb.* | .42 / .44 |
| Lampblack (commercial), *l.c.l.* | *lb.* | .15 |

#### Blue

| | | |
|---|---|---|
| Du Pont Dispersed | *lb.* | .83 / 3.95 |
| Powders | *lb.* | 2.25 / 3.75 |
| Heliogen BKA | *lb.* | |
| Toners | *lb.* | |

#### Brown

| | | |
|---|---|---|
| Mapico | *lb.* | .11 |

#### Green

| | | |
|---|---|---|
| Chrome | *lb.* | .25 |
| oxide (*freight allowed*) | *lb.* | .24 |
| Du Pont Dispersed | *lb.* | .98 / 2.85 |
| Powders | *lb.* | 1.00 / 5.50 |
| Guignet's (*bbls.*) | *lb.* | .70 |
| Toners | *lb.* | |

### Orange

| | | |
|---|---|---|
| Du Pont Dispersed | lb. | $0.88 /$2.00 |
| Powders | lb. | .88 / 2.75 |
| Toners | lb. | |

### Orchid

| | | |
|---|---|---|
| Toners | lb. | |

### Pink

| | | |
|---|---|---|
| Toners | lb. | |

### Purple

| | | |
|---|---|---|
| Toners | lb. | |

### Red

| | | |
|---|---|---|
| Antimony | | |
| Crimson, 15/17% | lb. | |
| R. M. P. No. 3 | lb. | .48 |
| Sulphur free | lb. | |
| R.M.P. | lb. | .52 |
| Golden 15/17% | lb. | |
| 7-A | lb. | .37 |
| Z-2 | lb. | .25 |
| Cadmium, light (400-*lb.* *bbls.*) | lb. | .80 / .85 |
| Du Pont Dispersed | lb. | .93 / 2.05 |
| Powders | lb. | .30 / 1.65 |
| Iron Oxide, *l.c.l.* | lb. | |
| Mapico | lb. | .0975 |
| Rub-Er-Red (*bbls.*) | lb. | .0975 |
| Toners | lb. | |

### White

| | | |
|---|---|---|
| Lithopone (*bags*) | lb. | .0385/ .0410 |
| Albalith | lb. | .0385/ .0410 |
| Astrolith (50-*lb.* *bags*) | lb. | .0385/ .0410 |
| Azolith | lb. | .0385/ .0410 |
| Titanium Pigments | | |
| Ray-bar | lb. | .055 / .065 |
| Ray-cal | lb. | .0525/ .0625 |
| Rayox | lb. | .135 / .165 |
| Titanolith (50-*lb.* *bags*) | lb. | .0525/ .055 |
| Titanox-A | lb. | .145 / .175 |
| B | lb. | .0575/ .0625 |
| 30 | lb. | .0575/ .0625 |
| C | lb. | .055 / .06 |
| M | lb. | .0575/ .0625 |
| Ti-Tone | lb. | |
| Zopaque (50-*lb.* *bags*) | lb. | .145 / .1525 |
| Zinc Oxide | | |
| Azo ZZZ-11 | lb. | .07 / .0725 |
| 44 | lb. | .07 / .0725 |
| 55 | lb. | .07 / .0725 |
| 66 | lb. | .085 / .0875 |
| French Process, Florence | | |
| Green Seal-8 | lb. | .0825/ .0850 |
| Red Seal-9 | lb. | .0775/ .08 |
| White Seal-7 | lb. | .0875/ .09 |
| Kadox, Black Label-15 | lb. | .065 / .0675 |
| No. 25 | lb. | .0775/ .08 |
| Red Label-17 | lb. | .065 / .0675 |
| Horse Head Special 3 | lb. | .065 / .0675 |
| XX Red-4 | lb. | .065 / .0675 |
| 23 | lb. | .065 / .0675 |
| 72 | lb. | .065 / .0675 |
| 78 | lb. | .065 / .0675 |
| 80 | lb. | .065 / .0675 |
| 103 | lb. | .065 / .0675 |
| 110 | lb | .065 / .0675 |
| St. Joe (lead free) | | |
| Black Label | lb. | .065 / .0675 |
| Green Label | lb. | .065 / .0675 |
| Red Label | lb. | .065 / .0675 |
| U.S.P | lb. | .0975/ .10 |
| Zinc Sulphide Pigments | | |
| Cryptone-BA-19 | lb. | .0525/ .055 |
| BT | lb. | .0525/ .055 |
| CB | lb. | .0525/ .055 |
| MS | lb. | .055 / .0575 |
| ZS No. 20 | lb. | .0775/ .08 |
| 86 | lb. | .0775/ .08 |
| 230 | lb. | .0775/ .08 |
| 800 | lb. | .0775/ .08 |
| Sunolith | lb. | .0385/ .0410 |

### Yellow

| | | |
|---|---|---|
| Cadmolith (cadmium yellow), (400-*lb.* *bbls.*) | lb. | .55 / .60 |
| Du Pont Dispersed | lb. | 1.25 / 1.75 |
| Powders | lb. | .16 / 1.37 |
| Mapico | lb. | .0725 |
| Toners | lb. | |

## Dispersing Agents

| | | |
|---|---|---|
| Bardex | lb. | .04 / .0425 |
| Bardol | lb. | .0241/ .0265 |
| B | lb. | .045 / .0475 |
| Darvan No. 1 | lb. | .30 / .34 |
| No. 2 | lb. | .30 / .34 |
| Nevoll (*drums, c.l.*) | lb. | .0240 |
| Santomerse S | lb. | .11 / .25 |

## Fillers, Inert

| | | |
|---|---|---|
| Asbestine, *c.l.* | ton | 15.00 |
| Barytes | ton | 40.00 |
| f.o.b., St. Louis (50-*lb. paper bags*) | ton | 23.05 |
| off color, domestic | ton | 21.50 /26.50 |
| white, imported | ton | |
| Blanc fixe, dry, precip | lb. | .045 / .055 |
| Calcene | ton | 37.50 /43.00 |
| Infusorial earth | lb. | .025 / .03 |
| Kalite No. 1 | ton | 26.00 |
| 3 | ton | 36.00 |
| Kalvan | ton | 100.00 |
| Magnesia, calcined, heavy | lb. | |
| Magnesium Carbonate, *l.c.l.* | lb. | .0725/ .095 |
| Paradene No. 2 (*drums*) | lb. | .05 |
| Pyrax A | ton | 7.00 |
| Whiting | | |
| Columbia Filler | ton | $9.00 /$14.00 |
| Suprex, white extra light | ton | 30.00 |
| heavy | ton | 30.00 |
| Witco, *c.l.* | ton | 8.00 |

## Finishes

| | | |
|---|---|---|
| Black-Out (surface protective) | gal. | 4.00 / 5.00 |
| Mica, *l.c.l.* | ton | |
| Rubber lacquer, clear | gal. | 1.00 / 2.00 |
| colored | gal. | 2.00 / 3.50 |
| Shoe Varnish | gal. | 1.45 |
| Talc | ton | .025 / .035 |

## Flock

| | | |
|---|---|---|
| Cotton flock, dark | lb. | .09 / .12 |
| dyed | lb. | .40 / .80 |
| white | lb. | .11 / .20 |
| Rayon flock, colored | lb. | 1.00 / 2.00 |
| white | lb. | .75 / 1.00 |

## Latex Compounding Ingredients

| | | |
|---|---|---|
| A-342 | lb. | 1.00 / 1.25 |
| Accelerator 85 | lb. | .35 |
| 89 | lb. | 1.20 |
| 122 | lb. | 1.30 |
| 552 | lb. | 1.90 |
| Aerosol OT Aqueous 10% | lb. | .125 |
| Antox, dispersed | lb. | .42 |
| Aquarex D | lb. | .75 |
| F | lb. | .85 |
| Areskap No. 50 | lb. | .18 / .24 |
| 100, dry | lb. | .39 / .51 |
| Aresket No. 240 | lb. | .16 / .22 |
| 300, dry | lb. | .42 / .50 |
| Aresklene No. 375 | lb. | .35 / .50 |
| 400, dry | lb. | .51 / .65 |
| Black No. 25, dispersed | lb. | .22 / .40 |
| Casein | lb. | |
| Collocarb | lb. | .07 |
| Color Pastes, dispersed | lb. | .38 / 1.90 |
| Copper Inhibitor X-872 | lb. | 2.25 |
| Dispersex No. 15 | lb. | .11 / .12 |
| No. 20 | lb. | .08 / .10 |
| Factex Dispersion A | lb. | .16 |
| Heliozone, dispersed | lb. | .25 |
| Igepon A | lb. | |
| Latac | lb. | 2.50 |
| MICRONEX, Colloidal | lb. | .06 / 07 |
| Nekal BX (dry) | lb. | |
| Pipsol X | lb. | 3.05 / 3.55 |
| R-2 Crystals | lb. | 2.50 / 2.75 |
| RN-2 Crystals | lb. | 1.90 / 2.15 |
| S-1 (400-*lb. drums*) | lb. | .65 |
| Santobrite Briquettes | lb. | |
| Powder | lb. | |
| Santomerse D | lb. | .41 / .65 |
| S | lb. | .11 / .25 |
| Stablex A | lb. | .90 / 1.10 |
| B | lb. | .65 / .90 |
| C | lb. | .40 / .50 |
| Sulphur, dispersed | lb. | .10 / .15 |
| No. 2 | lb. | .08 / .12 |
| T-1 (440-*lb. drums*) | lb. | .40 |
| Tepidone | lb. | .63 |
| Vulcan Colors | lb. | |
| Zenite Special | lb. | .55 |
| Zinc oxide, dispersed | lb. | .12 / .15 |

## Mineral Rubber

| | | |
|---|---|---|
| Black Diamond, *l.c.* | ton | 25.00 /27.00 |
| B.R.C. No. 20 | lb. | .010 / .011 |
| Hydrocarbon, hard | ton | 25.00 /27.00 |
| Genasco Hydrocarbon, granulated | ton | |
| solid | ton | |
| Gilsonite | ton | |
| Parmr | ton | 25.00 /29.00 |
| Pioneer, *c.l.* | lb. | 25.00 /27.00 |
| 285°-300° | ton | 25.00 /27.00 |

## Mold Lubricants

| | | |
|---|---|---|
| Aluminum Stearate | lb. | .21 / .24 |
| Aquarex D | lb. | .75 |
| WA Paste | lb. | .25 |
| Lubrex | lb. | .25 / .30 |
| Mold Paste | lb. | .12 / .18 |
| Rubber-Glo, conc. regular | gal. | .94 / 1.15 |
| Type W | gal. | .99 / 1.20 |
| Sericite | ton | 65.00 /75.00 |
| Soapstone, *l.c.l.* | ton | 25.00 /35.00 |

## Oil Resistant

| | | |
|---|---|---|
| A-X-F | lb. | .82 / .85 |

## Reclaiming Oils

| | | |
|---|---|---|
| B.R.V | lb. | .0325/ .035 |
| No. 1621 | lb. | .02 / .021 |
| S.R.O. | lb. | .019 / .02 |
| X-159 | gal. | .20 / .32 |
| Rox No. 1 | lb. | .0225/ .025 |

## Reenforcers

| | | |
|---|---|---|
| Carbon Black | | |
| Aerfloted Arrow Specificaton (*bags only*) | lb. | .0335† |
| Arrow Compact Granulized | lb. | .0335† |
| Certified Heavy Compressed (*bags only*) | lb. | .0335† |
| Spheron | lb. | .0335† |
| Continental, dustless | lb. | $0.0335† |
| Compressed (*bags only*) | lb. | .0335† |
| Disperso | lb. | .0335† |
| Dixie | lb. | .0335† |
| Dixiedensed | lb. | .0335† |
| 66 | lb. | .0335† |
| Excello, dustless | lb. | .0335† |
| Furnex | lb. | .03 |
| Beads | lb. | .03 |
| Gastex | lb. | .03 /$0.07 |
| Kosmobile | lb. | .0335† |
| 66 | lb. | .0335† |
| Kosmos | lb. | .0335† |
| MICRONEX Beads | lb. | .0335† |
| Mark II | lb. | .0335 |
| Standard | lb. | .0335 |
| W-5 | lb. | .0335 |
| W-6 | lb. | .0335 |
| P-33 | lb. | .0475 |
| Pelletex | lb. | .03 / .07 |
| Supreme, dustless | lb. | .0335† |
| Thermax | lb. | .0225 |
| Velvetex | lb. | .04 / .06 |
| "WYEX BLACK" | lb. | .0335† |
| Carbonex Flakes | lb. | .029 / .034 |
| S | lb. | .03 / .0325 |
| Plastic | lb. | .03 / .0325 |
| Clays | | |
| Aerfloted Paragon (50-lb. *bags*) | ton | 10.00 |
| Suprex (50-*lb. bags*) | ton | 10.00 |
| Barden | ton | 10.00 |
| Catalpo, *c.l.* | ton | 30.00 |
| Chicora | ton | 10.00 |
| China | ton | 22.50 /25.00 |
| Crown | ton | 10.00 |
| Dixie | ton | 10.00 |
| Hi-White | ton | 10.00 |
| "L" | ton | |
| Langford | ton | 7.50 |
| McNamee | ton | 10.00 |
| Par | ton | 10.00 |
| Paraforce, *c.l.* | ton | 50.00 |
| Witco, *c.l.* | ton | 10.00 |
| Cumar EX | lb. | .05 |
| MH | lb. | .065 / .115 |
| V | lb. | .095 / .125 |
| Silene | lb. | .04 / .045 |

†Price quoted is f.o.b. works (bags). The price f.o.b. works (bulk) is $0.0315 per pound. All prices are carlot.

## Reodorants

| | | |
|---|---|---|
| Amora A | lb. | |
| B | lb. | |
| C | lb. | |
| D | lb. | |
| Curodex 19 | lb. | |
| 188 | lb. | |
| 198 | lb. | |
| Para-Dors | lb. | |
| Rodo No. 0 | lb. | 4.00 / 4.50 |
| 10 | lb. | 5.00 / 5.50 |

## Rubber Substitutes

| | | |
|---|---|---|
| Black | lb. | .08 / .13 |
| Brown | lb. | .08 / .135 |
| White | lb. | .085 / .145 |
| Factice | | |
| Amberex Type B | lb. | .1875 |
| Brown | lb. | .10 / .13 |
| Fac-Cel B | lb. | .15 |
| C | lb. | .15 |
| Neophax A | lb. | .13 |
| B | lb. | .13 |
| White | lb. | .10 / .15 |

## Softeners and Plasticizers

| | | |
|---|---|---|
| B.R.T. No. 7 | lb. | .0175 /.0185 |
| Bondogen | lb. | .98 / 1.05 |
| Burgundy pitch | lb. | |
| Copene Resin | lb | .30 |
| Cycline oil | gal. | .14 / .20 |
| Dipolymer Oil | gal. | .30 / .35 |
| Dispersing Oil No. 10 | lb. | .035 / .0375 |
| Nevinol | lb. | .13 / .14 |
| Nuba resinous pitch (*drums*) | | |
| Grades No. 1 and No. 2 | lb. | .029 |
| 3-X | lb. | .0425 |
| Nypene Resin | lb. | .30 |
| Palm oil (Witco), *c.l.* | lb. | |
| Palmol | lb. | .15 |
| Para Flux | gal | .09 / .18 |
| No. 2016 | gal. | .125 / .20 |
| Para Lube | lb. | .0425/ .048 |
| Piccolyte Resin | lb. | .14 / .175 |
| Pine tar | gal. | |
| Oil | gal. | |
| Plastogen | lb. | .0775/ .08 |
| Plastone | lb. | .27 / .30 |
| R-19 Resin (*drums*) | lb. | .105 |
| 21 Resin (*drums*) | lb. | .105 |
| Reogen | lb. | .12 / .18 |
| RPA No. 1 | lb. | .65 |
| 2 | lb. | .65 |
| 3 | lb. | .46 |
| 4 | lb. | .80 |
| Tackol | lb. | .085 / .18 |
| Tonox | lb. | .52 / .61 |
| Tonox D | lb. | .75 / .85 |
| Witco No. 20, *l.c.l.* | gal. | .20 |
| X-1 resinous oil (*tank car*) | lb. | .011 |

## Softeners for Hard Rubber Compounding

| | | |
|---|---|---|
| Resin C Pitch 45° C. M.P. | lb. | .013 / .014 |
| 60°C. M.P. | lb. | .013 / .014 |
| 75°C. M.P. | lb. | .013 / .014 |

(*Continued on page 200*)

# COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

| Futures | Aug. 30 | Sept. 27 | Oct. 4 | Oct. 11 | Oct. 18 | Oct. 25 |
|---|---|---|---|---|---|---|
| Oct. | 16.99 | 16.34 | 17.12 | 16.67 | ..... | ..... |
| Nov. | ..... | 16.45 | 17.23 | 16.76 | 16.28 | 16.13 |
| Dec | 17.16 | 16.56 | 17.34 | 16.85 | 16.38 | 16.23 |
| Mar. | 17.39 | 16.81 | 17.61 | 17.11 | 16.58 | 16.52 |
| July | 17.40 | 16.94 | 17.94 | 17.37 | 16.81 | 16.72 |
| Sept. | ..... | ..... | ..... | ..... | 16.91 | 16.82 |

## New York Quotations

### October 24, 1941

#### Drills

| | | |
|---|---|---|
| 38-inch 2.00-yard | *yd.* | $0.21 |
| 40-inch 3.47-yard | | .13 |
| 50-inch 1.52-yard | | .28 |
| 52-inch 1.85-yard | | .23⅝ |
| 52-inch 1.90-yard | | .23 /.23⅜ |
| 52-inch 2.20-yard | | .21½ |
| 52-inch 2.50-yard | | .18⅞ |
| 59-inch 1.85-yard | | .24 |

#### Ducks

| | | |
|---|---|---|
| 38-inch 2.00-yard D. F. | *yd.* | .21½ |
| 40-inch 1.45-yard S. F. | | .29 |
| 51½-inch 1.35-yard D. F. | | .31⅛ |
| 72-inch 1.05-yard D. F. | | .42⅞/.48½ |
| 72-inch 17-21 ounce | | .54¼ |
| **Mechanicals** | | |
| Hose and belting | *lb.* | .45 |
| **Tennis** | | |
| 51½-inch 1.35-yard | *yd.* | .33⅜ |
| 51½-inch 1.60-yard | *yd.* | .28¾ |
| 51½-inch 1.90-yard | *yd.* | .23¾ |

#### Hollands—White

| | | |
|---|---|---|
| **Blue Seal** | | |
| 20-inch | *yd.* | .12 |
| 30-inch | | .21½ |
| 40-inch | | .24 |
| **Gold Seal** | | |
| 20-inch No. 72 | *yd.* | .12¾ |
| 30-inch No. 72 | | .22½ |
| 40-inch No. 72 | | .25½ |
| **Red Seal** | | |
| 20-inch | *yd.* | .11¼ |
| 30-inch | | .20¼ |
| 40-inch | | .22½ |

#### Osnaburgs

| | | |
|---|---|---|
| 40-inch 2.34-yard | *yd.* | .17⅝ |
| 40-inch 2.48-yard | | .16⅞ |
| 40-inch 2.56-yard | | .14½ |
| 40-inch 3.00-yard | | .14 |
| 40-inch 7-ounce part waste | | .13⅛ |
| 40-inch 10-ounce part waste | | .18¾ |
| 37-inch 2.42-yard clean | | .17 |

#### Raincoat Fabrics

| | | |
|---|---|---|
| **Cotton** | | |
| Bombazine 64 x 60 | *yd.* | |
| Plaids 60 x 48 | | |
| Surface prints 64 x 60 | | |
| Print cloth, 38½-inch, 64 x 60 | | |
| **Sheetings, 40-Inch** | | |
| 48 x 48, 2.50-yard | *yd.* | .14200 |
| 64 x 68, 3.15-yard | | .12380 |
| 36 x 60, 3.60-yard | | .10555 |
| 44 x 40, 4.25-yard | | .08588 |
| **Sheetings, 36-Inch** | | |
| 48 x 48, 5.00-yard | *yd.* | .07600 |
| 44 x 40, 6.15-yard | | .06178 |

#### Tire Fabrics

| | | |
|---|---|---|
| **Builder** | | |
| 17¼ ounce 60" 23/11 ply Karded peeler | *lb.* | .39 |
| **Chafer** | | |
| 14 ounce 60" 20/8 ply Karded peeler | *lb.* | .38½ |
| 9¼ ounce 60" 10/2 ply Karded peeler | *lb.* | .38 |
| **Cord Fabrics** | | |
| 23/5/3 Karded peeler, 1 1/16" cotton | *lb.* | .39½ |
| 15/3/3 Karded peeler, 1 1/16" cotton | *lb.* | .37½ |
| 12/4/2 Karded peeler, 1 1/16" cotton | *lb.* | .36½ |
| 23/5/3 Karded peeler, 1¼" cotton | *lb.* | .44 |
| 23/5/3 Combed Egyptian | *lb.* | .58½ |
| **Leno Breaker** | | |
| 8¼ ounce and 10¼ ounce 60" Karded peeler | *lb.* | .41 |

THE market fluctuated within wide limits last month as reflected in the 15/16-inch spot middling price which, after closing on September 30 at 17.48¢ per pound, reached a high of 18.02¢ per pound October 4 and a low of 16.59¢ October 16. Thereafter the market ruled firm, with the price closing at 16.93¢ per pound on October 28.

The Crop Reporting Board of the Department of Agriculture estimated a cotton crop for the current season amounting to 11,061,000 bales of 500 pounds gross weight based on a condition to 64% as of October 1. The final yield of the 1940-1941 season was 12,566,000 bales. The cotton trade had anticipated a lower forecast for October 1, and the news was reflected in the futures market which dropped from 29 to 35 points on October 8, the date of the announcement.

Shippers who will guarantee not to export cotton to Axis or Axis-dominated ports may purchase their supplies from the Commodity Credit Corp. at 13.25¢ per pound. Shipments of such cotton to Canada will benefit by an additional subsidy starting at 2.5¢ per pound which will reportedly make American cotton competitive with Brazilian cotton of equal quality; the Brazilian product has been sold to Canada at from 11.25¢ to 12.25¢ per pound. The subsidy will be available only for a limited time as the Administration does not desire to disrupt the Brazilian-Canadian commerce.

Domestic consumption of cotton in September amounted to 875,682 running bales, against 874,113 bales in July and 638,235 bales in September, 1940, according to the Bureau of the Census. Cotton stocks in consuming establishments September 30 were placed at 1,636,521 bales, and stocks in public storage and at warehouses totaled 11,523,702 bales.

The Bureau of the Census reported that 63,217 running bales of cotton were used in tire fabrics and cords during August, 1941, 7.2% of the total of 874,113 running bales used during that month. The percentages for July and June were, respectively, 7.2% and 7.6%.

### Fabrics

Reacting to the stimulus of a sliding scale price schedule which makes ceiling prices dependent upon the price of spot raw cotton, trading in cotton textiles swelled substantially on October 20, and it was felt that the market, which had come to a virtual standstill when the fixed price ceilings were announced in July, would resume a more normal pace. During the early part of October trading had been listless as buyers and sellers awaited definite knowledge about the new price schedule. Trading had accelerated appreciably on October 16 and 17, the two days of trading before the details of the sliding scale schedule were made known, to represent the highest two-day level of business since July. Fabrics of special construction were reported to be in heavy demand.

As announced by Leon Henderson, administrator, OPA, on October 20, the new schedule covers all leading types of cotton goods made of carded yarn, from coarse bagging and tough work-clothing denims to fine-count broad cloths, although chief types of "fine goods" made of combed yarn will continue under the original gray-goods schedule. Wide sheetings, wide drills, wide print cloths, and tickings are not yet included, but are understood to be under investigation; while attention is being paid to prices of the various grades of duck and tire fabrics. Future studies will include napped fabrics and towelings.

The price schedule of cotton cloth used in making rubberized ponchos for the United States Marine Corps was revised by Mr. Henderson on October 5 so that a premium of ¾¢ per yard may be added to the ceiling price of 13½¢ per yard for 40-inch combed lawn, 96 x 100.

As a result of the new schedule, prices of fabrics affected are stabilized and will fluctuate only as the price of raw cotton varies. Prices shown here this month showed a mixed trend as compared with last month, even varying within the same group. Raincoat fabrics prices are unavailable at the present time. Tire fabrics have advanced 1¢ per pound in price.

## Current Quotations

(*Continued from page* 198)

#### Solvents

| | | |
|---|---|---|
| Beta-Trichlorethane | *lb.* | .20 |
| Carbon Bisulphide | *lb.* | |
| Tetrachloride | *gal.* | |
| Cosol No. 1 | *gal.* | .32 |
| No. 2 | *gal.* | .32 |
| No. 3 | *gal.* | .30 |
| Industrial 90% benzol (*tank car*) | *gal.* | .14 / .21 |
| Skellysolve | *gal.* | |

#### Stabilizers for Cure

| | | |
|---|---|---|
| Calcium Stearate | *lb.* | .23 / .27 |
| Laurex (*bags*) | *lb.* | .15 / .175 |
| Lead Stearate | *lb.* | |
| Stearex B | *lb.* | .1375/ .1475 |
| Beads | *lb.* | .1325/ .1425 |
| Stearic acid, single pressed | *lb.* | .1375/ .1475 |
| Stearite, *c.l.* | *lb.* | .1325 |
| Zinc stearate | *lb.* | .26 / .31 |

#### Synthetic Rubber

| | | |
|---|---|---|
| Hycar O. R. | *lb.* | .70 / 1.00 |
| Neoprene Type CG | *lb.* | .70 |
| E | *lb.* | .65 |
| FR | *lb.* | .75 |
| G | *lb.* | .70 |
| GN | *lb.* | .65 |
| I | *lb.* | .70 |
| KN | *lb.* | .75 |
| M | *lb.* | .65 |
| Neoprene Latex Type 56 | *lb.* | .30 |
| 57 | *lb.* | .30 |
| Synthetic 100 | *lb.* | .41 |
| "Thiokol" Type "A" | *lb.* | .35 / .45 |
| "F" | *lb.* | .45 / .55 |
| "FA" | *lb.* | .50 / .60 |
| "RD" | *lb.* | .70 |

#### Tackifier

| | | |
|---|---|---|
| B.R.H. No. 2 | *lb.* | .02 / .021 |

#### Vulcanizing Ingredients

| | | |
|---|---|---|
| Magnesia, light (for neoprene) | *lb.* | |
| Sulphur | 100 *lbs.* | 2.05 |
| Chloride (*drums*) | *lb.* | .04 |
| Telloy | *lb.* | 1.75 |
| Vandex | *lb.* | 1.75 |

(See also Colors—Antimony)

#### Waxes

| | | |
|---|---|---|
| Carnauba, No. 3 chalky | *lb.* | |
| 2 N.C. | *lb.* | |
| 3 N.C. | *lb.* | |
| 1 Yellow | *lb.* | |
| 2 | *lb.* | |


REPORTING ABOARD
Blue jackets from the Navy Yard Receiving Ship, report aboard for duty. The big bundle each man carries is his hammock lashed around his sea bag. (Both made of heavy canvas.) His bed and all his worldly possessions are in this pack. The party is wearing cool summer uniforms of cotton.
As each man steps aboard, he observes an ancient sea custom by facing aft and saluting the quarter deck. Salute is returned by Officer of the Deck at head of gangway, dressed in white service uniform, with a long glass, symbol of this authority, held in his left hand. While wood has given way to steel in the modern Navy, cotton is still No. 1 defense requirement for sailors' comfort and protection.
★ ★ ★
This, in turn, means that the supply of many of our fabrics, including HOSE AND BELTING DUCKS, OSNABURGS, etc., normally available to you will be somewhat limited during the present emergency.
WELLINGTON SEARS COMPANY, 65 WORTH STREET, NEW YORK CITY, N. Y.
Cottons FOR DEFENSE... WELLINGTON SEARS FOR Cottons

## RECLAIMED RUBBER

According to the R. M. A., September reclaimed rubber consumption is estimated at 24,032 long tons, 15.2% above the August figure; production, 24,678 long tons; and stocks on hand September 30, 38,055 long tons. As consumption of crude rubber is forced down by government restriction, the demand for reclaim is increasing appreciably. This may be seen in the sharply increasing ratio of reclaim to crude rubber usage during the past three months; in July the percentage of reclaim consumed to crude was 31.8; in August, 37.7, and in September, 44.8. Despite the statistical picture in regard to reclaim stocks which indicate over 1½ months' supply, evidences indicate a continued tightness in available reclaim.

The market continues steady with all grades of reclaim unchanged except red inner tubes, which advanced 1¢ a pound.

### New York Quotations

October 22, 1941

| Auto Tire | Sp. Grav. | ¢ per lb. |
|---|---|---|
| Black Select | 1.16-1.18 | 6½/ 6¾ |
| Acid | 1.18-1.22 | 7½/ 7¾ |
| **Shoe** | | |
| Standard | 1.56-1.60 | 7 / 7¼ |
| **Tubes** | | |
| Black | 1.14-1.26 | 11¼/11½ |
| Gray | 1.15-1.26 | 12½/13¼ |
| Red | 1.15-1.30 | 13 /13¼ |
| **Miscellaneous** | | |
| Mechanical blends | 1.25-1.50 | 4½/ 5½ |
| White | 1.35-1.50 | 13½/14½ |

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

### United States Reclaimed Rubber Statistics—Long Tons

| Year | Production† | Consumption† | Consumption % of Crude | U. S. Stocks*† | Exports |
|---|---|---|---|---|---|
| 1939 | 186,000 | 170,000 | 28.7 | 25,250 | 12,611 |
| 1940 | 208,971 | 190,244 | 29.3 | 32,636 | 11,347 |
| 1941 | | | | | |
| Jan. | 20,413 | 19,086 | 28.9 | 33,380 | 557 |
| Feb. | 19,507 | 18,222 | 29.1 | 33,654 | 1,009 |
| Mar. | 22,006 | 19,611 | 28.4 | 35,028 | 1,002 |
| Apr. | 21,574 | 20,427 | 28.6 | 35,336 | .... |
| May | 22,775 | 21,405 | 30.0 | 35,871 | .... |
| June | 23,790 | 22,559 | 26.5 | 36,265 | .... |
| July | 23,111 | 21,725 | 31.8 | 36,751 | .... |
| Aug. | 24,111 | 20,864 | 37.7 | 39,099 | .... |
| Sept. | 24,678 | 24,032 | 44.8 | 38,055 | .... |

*Stocks on hand the last of the month or year. †Corrected to 100% from estimates of reported coverage. *Compiled by The Rubber Manufacturers Association, Inc.*

### Statement of INDIA RUBBER WORLD

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of India Rubber World, published monthly at New York, N. Y., for October 1, 1941.

State of New York }
County of New York } ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared Edward Lyman Bill, President of Bill Brothers Publishing Corp., who, having been duly sworn according to law, deposes and says that he is the Publisher of India Rubber World and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and, if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse side of this form, to wit:

1. That the names and addresses of the publisher, editor, manager editor, and business managers are; publisher, Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y., editor, E. V. Osberg, 420 Lexington Ave., New York, N. Y.; managing editor, E. V. Osberg, 420 Lexington Ave., New York, N. Y.; business manager, B. B. Wilson, 420 Lexington Ave., New York, N. Y.

2. That the owner is: Bill Brothers Publishing Corp., Caroline L. Bill, Raymond Bill, Edward Lyman Bill, Randolph Brown, all at 420 Lexington Ave., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1% or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders, as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Edward Lyman Bill,
Publisher.

Sworn to and subscribed before me this 1st day of October, 1941.

[SEAL]

Wm. A. Low.

Notary Public Queens Co. No. 1116, Reg. No. 7389. Certificate filed in N. Y. Co. No. 757, Reg. No. 3L460.

(Commission expires March 30, 1943)

### Rubber and Canvas Footwear Statistics

| | Thousands of Pairs | | |
|---|---|---|---|
| | Inventory | Production | Shipments |
| 1938 | 16,183 | 50,812 | 54,942 |
| 1939 | 16,388 | 60,612 | 60,377 |
| 1940 | 11,129 | 57,278 | 62,480 |
| 1941 | | | |
| Jan. | 10,377 | 5,939 | 6,614 |
| Feb. | 10,754 | 5,543 | 5,166 |
| Mar. | 11,222 | 5,827 | 5,359 |
| Apr. | 12,272 | 6,628 | 5,555 |
| May | 13,223 | 6,084 | 5,134 |
| June | 13,834 | 6,278 | 5,668 |
| July | 12,256 | 4,789 | 6,366 |
| Aug. | 10,809 | 5,543 | 6,990 |

The above figures have been adjusted to represent 100% of the industry based on reports received which represented 81% for 1936-37.

Source: *Survey of Current Business,* Bureau of Foreign & Domestic Commerce, Washington, D. C.

## FINANCIAL

*Unless otherwise stated, the results of operations of the following are after all charges, federal income and excess profits taxes and other deductions. Figures in most cases are subject to audit and final year-end adjustments.*

**Baldwin Locomotive Works,** Philadelphia, Pa., and subsidiaries. Year ended September 30: consolidated net profit, after all charges including $3,594,000 for excess profits tax and $163,029 for preferred dividends, $3,910,222, equal to $3.64 each on 1,028,722 common shares, against $1,213,880, or $1.04 a share, in the preceding 12 months; consolidated sales, $82,919,923, against $44,627,724.

**Boston Woven Hose & Rubber Co.,** Cambridge, Mass. Year to August 31: net income, $616,912, equal, after preferred dividends, to $6.65 each on 86,000 common shares, against $281,796, or $2.75 a common share in the previous 12 months; gross sales, $9,147,319, against $6,701,945.

**E. I. du Pont de Nemours & Co., Inc.,** Wilmington, Del., and wholly owned subsidiaries. September quarter, 1941: earnings, after all charges, $23,060,430, equal to $2.09 each on 11,045,055 common shares, against $19,177,921, or $1.74 each on 11,037,815 shares, in the third quarter of 1940; net sales and other operating revenues $130,633,618, against $91,797,317; provision for federal income taxes, $27,500,000, against $16,030,000. First nine months, 1941: net sales and other operating revenues, $365,694,774, against $254,815,899 in the same period last year; total income, $144,273,644, against $98,328,497; federal income taxes, $74,420,000, against $30,400,000 in the first nine months of 1940.

**Monsanto Chemical Co.** and domestic subsidiaries, St. Louis, Mo. Third quarter, 1941: net income, $1,673,921, or $1.19 a common share, against 81¢ a share in the same quarter last year; sales, $16,214,755, 43% above the 1940 figure. First nine months, 1941: earnings, including a $281,400 dividend from the British subsidiary and after $7,379,722 provision for income taxes, equal to $3.57 a share, against $2.51 for the 1940 period.

**S. S. White Dental Mfg. Co.,** Philadelphia, Pa., and subsidiaries. March quarter: net profit after foreign exchange losses and $20,000 reserve for foreign contingencies, $127,636, equal to 43¢ each on 294,230 shares of capital stock contrasted with $63,372, or 21¢ each on 294,230 shares, for the 1940 quarter. The report includes operations of foreign subsidiaries, except the French company. First half, 1941: net income, after $234,160 provision for excess and income taxes, $323,529, equal to $1.10 each on 294,075 shares, against $120,991, after federal taxes of $58,153, or 41¢ a share, in the first half last year; net sales, $5,466,720, against $4,191,529 in the first six months of 1940.

# CLASSIFIED ADVERTISEMENTS

*ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE*

| GENERAL RATES | SITUATIONS WANTED RATES | SITUATIONS OPEN RATES |
|---|---|---|
| Light face type $1.00 per line (ten words) | Light face type 40c per line (ten words) | Light face type 75c per line (ten words) |
| Bold face type $1.25 per line (eight words) | Bold face type 55c per line (eight words) | Bold face type $1.00 per line (eight words) |

*Allow nine words for keyed address.* *Replies forwarded without charge*

### SITUATIONS WANTED

EXPERIENCED TECHNICAL EXECUTIVE WITH OVER 20 YEARS' experience in the rubber industry, the last ten in management and sales, desires connection with private or closely-held company of moderate size. Thoroughly experienced with plastic extrusion. Address Box No. 336, care of INDIA RUBBER WORLD.

**RUBBER CHEMIST. 3 YEARS' EXPERIENCE IN compounding of rubber and synthetics, plant and laboratory management, molding, processing problems. Desires responsible position. Location immaterial. Address Box No. 337, care of INDIA RUBBER WORLD.**

PRODUCTION MAN, YOUNG ABLE COMPOUNDER. HAS SOUND theoretical background, knowledge of costing. Desires change. Address Box No. 339, care of INDIA RUBBER WORLD.



### SITUATIONS WANTED *(Continued)*

FACTORY SUPERINTENDENT OR ASSISTANT, 25 YEARS' EXperience in compounding, development, and production of synthetics and rubber products. Experienced in installation and supervision of equipment. At present engaged in similar position. Location immaterial. Address Box No. 338, care of INDIA RUBBER WORLD.

CHEMIST (B.S.)—FOUR YEARS' EXPERIENCE IN GENERAL rubber compounding and technical service on factory production problems. Excellent scholastic record. Address Box No. 343, care of INDIA RUBBER WORLD.

CHIEF CHEMIST OR SUPERINTENDENT, THOROUGHLY EXperienced in all lines factory processing and compounding, research and development work on industrial rubber goods. Expert knowledge on reclaims and reclaiming. Two weeks' notice necessary. Address Box No. 344, care of INDIA RUBBER WORLD.

### SITUATION OPEN

CHEMIST FOR RESEARCH AND SERVICE WORK IN LATEX laboratory. Experience in latex field preferred, but not imperative if good background in general and colloid chemistry. Please state full details in first letter. Address Box No. 341, care of INDIA RUBBER WORLD.



*(Advertisements continued on page 204)*

# Classified Advertisements

Continued

## MACHINERY AND SUPPLIES FOR SALE

**FOR SALE**: 1—Watson-Stillman Hydro-Pneumatic Accumulator; 1—5 ft. dia. Vulcanizer, with quick-opening door; 20-Semi-automatic Hydraulic Presses; 1—Birmingham 16"x36" Rubber Mill, m.d.; 12—30"x40", 1—38"x78" Hydraulic Presses; Hydraulic Pumps, Calenders, Tubers, etc. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: Pulverizers; W. & P. Mixers, Lab. to 200 gal.; Driers; Presses; Pumps; Mills; etc. Large cash buyers of your surplus equipment—from single items to complete plants. BRILL EQUIPMENT CORPORATION, 183 Varick Street, New York City.

FOR SALE: 2—W. & P. Jack. Mixers, Size 15; 1—Day No. 30 Imperial Mixer; 1—Two-Roll Water-Cooled Rubber Mill, 6" & 8" dia. x 9" face; Rotary Cutters; 75 ft. Link Belt Conveyer, 36" wide; Hydraulic Presses, Pumps and Accumulators, Rubber Mills, Mixers, Grinders, Pulverizers, etc. Send for latest bulletins. We buy your surplus equipment. STEIN EQUIPMENT CORP., 426 Broome St., New York City.

## MACHINERY AND SUPPLIES WANTED

WANTED: ONE NO. 3 OR NO. 9 BANBURY MIXER; 3— MILLS; 1—Calender; 5—Hydraulic Presses, with pumps and accumulators; 2—Tubers. No dealers. Address Box No. 340, care of INDIA RUBBER WORLD.

EQUIPMENT IN GOOD OPERATING CONDITION. 2 MILLS 42" to 60"; tuber suitable for treads from calenders. State full particulars and best price. Address Box No. 342, care of INDIA RUBBER WORLD.

### Netherlands India

*(Continued from page 187)*

of interest due to holding rubber for shipment or of the commission to be paid to the New York agent. Producers sold readily, no doubt aware that once the Bureau began to operate, they would not be able to obtain more than 32¼ cents per half kilo for standard sheet. Under the circumstances it has been suggested that not much rubber would find its way to the Export Bureau in the beginning.

Later announcements to the effect that exporters would share in the exports on a pro-rata basis caused the eager buying to subside, and prices steadied again.

### The New Quota and Exports

The increase of permissible exports during the last quarter of 1941 to 120% brings the total 1941 export quota for all Netherlands India to 688,652 metric tons, of which estates may ship 350,628 tons and natives, 338,024 tons.

The decision to raise the quota again caused some surprise here, especially as total Netherlands India exports for the first seven months of 1941 were more than 30,000 tons below permissible. This shortage is entirely for account of estate rubber, exports of which totaled 164,406 tons, against permissible of 194,793.1 tons; native exports for the same period were 113 tons in excess, or 187,904 tons, against permissible of 187,791 tons.

### F. Kramer Honored

Among those specially honored on her sixty-first birthday by Queen Wilhelmina was F. Kramer, president of the General Agricultural Syndicate and of the Association of Central Experiment Stations, Java. Dr. Kramer was made an Officer of the Order of Orange-Nassau.

## Trade Lists Available

*Copies of the following trade lists may be obtained by American firms from the United States Bureau of Foreign and Domestic Commerce by referring to the titles. The price is $1 a list for each country.*

Automotive equipment, importers and dealers: Panama; Peru; Portuguese East Africa; Uruguay.
Boots and shoes, importers and dealers: Mexico.
Boots and shoes, manufacturers: Cuba; Honduras.
Dental supply houses: Dominican Republic; Guatemala.
Electrical supplies and equipment, importers and dealers: Dominican Republic; Nicaragua; Haiti.



See page 211

## World Net Imports of Crude Rubber—Long Tons

| Year | U.S.A. | U.K.† | Argentine | Australia | Belgium | Canada | France | Greater Germany‡ | Italy | Japan | Poland | Sweden | U.S.S.R. | Rest of World | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1938... | 406,300 | 168,172 | 7,700 | 12,300 | 11,300 | 25,700 | 58,100 | 107,900 | 28,200 | 46,300 | 7,900 | 8,300 | 26,800 | 49,200 | 928,000 |
| 1939... | 486,348 | 112,249¶ | 9,600 | 15,400 | 9,600 | 32,500 | 33,751§ | 62,344§ | 12,582§ | 42,300 | 5,41[illegible]§ | 7,965*a* | 14,000* | 61,866 | 603,842¶ |
| 1940... | 811,564 | .... | 10,019 | 19,044 | 1,585*b* | 52,567 | .... | .... | .... | 30,847*c* | .... | .... | .... | .... | .... |
| 1941 | | | | | | | | | | | | | | | |
| Jan. .. | 86,541 | .... | 706 | 1,065 | .... | 6,290 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Feb. .. | 73,646 | .... | 362 | 1,717 | .... | 3,770 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Mar. .. | 86,794 | .... | 975 | 3,486 | .... | 3,879 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Apr. .. | 64,521 | .... | 328 | 2,326 | .... | 2,531 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| May .. | 101,034 | .... | 376 | 1,549 | .... | 5,596 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| June .. | 64,101 | .... | 1,000 | 1,373 | .... | 2,818 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| July .. | 97,000* | .... | .... | .... | .... | 4,143 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Aug. .. | 105,000* | .... | .... | 2,003 | .... | 10,683 | .... | .... | .... | .... | .... | .... | .... | .... | .... |

*Estimated. †U. K. figures show gross imports, not net imports. ‡Including imports of Austria and Czechoslovakia. ¶Up to Aug. 31, 1939, only. §Up to July 31, 1939, only. *a*Up to September 30, 1939. *b*Jan.-Feb. *c*Jan.-Aug. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

## Shipments of Crude Rubber from Producing Countries—Long Tons

| Year | Malaya including Brunei and Labuan | N.E.I. | Ceylon | India | Burma | North Borneo | Sarawak | Thailand | French Indo-China | Total | Philippines and Oceania | Liberia | Nigeria (incl. Brit. Cameroons) | Other Africa | South America | Mexican Guayule | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1939 .. | 376,800 | 372,000 | 61,000 | 9,200 | 6,600 | 11,900 | 24,000 | 41,800 | 65,200 | 968,500 | 2,100* | 5,400 | 2,800 | 6,600* | 16,100 | 2,900 | 1,004,400 |
| 1940 .. | 540,417 | 536,899 | 88,930 | 13,649 | 9,668 | 17,623 | 35,166 | 43,940 | 64,437 | 1,350,729 | 2,267* | 7,223 | 2,903 | 7,200* | 17,601 | 4,106 | 1,392,029 |
| 1941 | | | | | | | | | | | | | | | | | |
| Jan. .. | 37,804 | 58,593 | 7,858 | ..... | 955 | 2,085 | 2,445 | 2,137 | 9,058 | 120,935 | 333 | 750* | 67 | 600 | 2,103 | 288 | 125,076 |
| Feb. .. | 27,115 | 42,091 | 4,346 | ..... | 1,022 | 1,686 | 2,922 | 4,137 | 1,995 | 85,314 | 96 | 828 | 254 | 600 | 1,814 | 414 | 89,320 |
| Mar. .. | 56,651 | 53,233 | 6,074 | ..... | 1,285 | 1,154 | 3,726 | 5,712 | 6,286 | 134,121 | 117 | 958 | 36 | 600 | 2,835 | 425† | 139,092 |
| Apr. .. | 40,590 | 48,915 | 6,991 | ..... | 1,164 | 2,175 | 3,118 | 4,217 | 0 | 107,224 | 263 | 750* | 200* | 600 | 2,009 | 433† | 111,469 |
| May .. | 53,062 | 48,099 | 7,786 | ..... | 1,019 | 1,237 | 3,849 | 1,841 | 6,225 | 123,118 | 156 | 180 | 200* | 600 | 1,080 | 334† | 125,668 |
| June .. | 51,247 | 48,496 | 8,925 | ..... | 822 | 986 | 3,195 | 2,831 | 7,318 | 123,820 | 200* | 750* | 200* | 600 | 1,510 | 250* | 127,330 |
| July .. | 53,373 | 53,429 | 7,387 | ..... | 666 | 1,803 | 3,799 | 3,614 | 5,000* | 129,071 | 200* | 750* | 200* | 600 | 1,253 | 250* | 132,324 |
| Aug. .. | 46,404 | 52,003 | 9,081 | ..... | 150 | 1,812 | 3,086 | 4,852 | 6,000* | 123,388 | 200* | 750* | 200* | 600 | 1,500 | 250* | 126,888 |

*Estimated. †Guayule rubber imports into U.S.A. provisional until export figures from Mexico are received. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

## Dominion of Canada Statistics

### Imports of Crude and Manufactured Rubber

| | August, 1941 | | Eight Months Ended August, 1941 | |
|---|---|---|---|---|
| UNMANUFACTURED | Quantity | Value | Quantity | Value |
| Crude rubber, etc. ........ *lb.* | 23,315,978 | $5,374,759 | 85,697,613 | $18,439,161 |
| Latex (dry weight) ...... *lb.* | 614,256 | 180,581 | 3,253,792 | 973,630 |
| Gutta percha ........... *lb.* | ...... | ...... | 11,182 | 6,051 |
| Rubber, recovered ........ *lb.* | 1,428,300 | 85,503 | 11,814,900 | 674,503 |
| Rubber, powdered, and gutta percha scrap .......... *lb.* | 816,600 | 15,559 | 4,031,600 | 81,978 |
| Balata .................. *lb.* | 11,126 | 3,239 | 46,132 | 12,973 |
| Rubber substitute ........ *lb.* | 61,000 | 20,491 | 387,500 | 123,234 |
| Totals ............... | 26,247,260 | $5,680,132 | 105,242,719 | $20,311,530 |
| PARTLY MANUFACTURED | | | | |
| Hard rubber comb blanks.... | ...... | $1,727 | ...... | $29,096 |
| Hard rubber, n. o. s....... *lb.* | 4,810 | 4,479 | 40,785 | 35,823 |
| Rubber thread not covered. *lb.* | 1,305 | 1,870 | 34,325 | 34,649 |
| Totals ................. | 6,115 | $8,076 | 75,110 | $99,568 |
| MANUFACTURED | | | | |
| Bathing shoes .......... *prs.* | 294 | $55 | 35,177 | $7,134 |
| Belting .................... | ...... | 15,146 | ...... | 127,110 |
| Hose ....................... | ...... | 24,559 | ...... | 216,267 |
| Packing .................... | ...... | 11,375 | ...... | 73,044 |
| Boots and shoes ......... *prs.* | 96 | 118 | 5,563 | 9,993 |
| Canvas shoes with rubber soles ................ *prs.* | ...... | ...... | 10,919 | 4,412 |
| Clothing, including waterproofed ................. | ...... | 4,881 | ...... | 28,733 |
| Raincoats ............. *no.* | 6,029 | 29,236 | 41,363 | 149,934 |
| Gloves ............ *doz. prs.* | 120 | 623 | 1,118 | 4,443 |
| Hot water bottles........... | ...... | 2,777 | ...... | 3,923 |
| Liquid sealing compound .... | ...... | 4,826 | ...... | 63,208 |
| Tires, bicycle ........... *no.* | 2,862 | 1,688 | 18,281 | 13,791 |
| Pneumatic ............ *no.* | 1,269 | 21,606 | 20,842 | 519,775 |
| Solid for automobiles and motor trucks ........ *no.* | 54 | 4,078 | 274 | 15,602 |
| Other solid tires ......... | ...... | 2,089 | ...... | 17,774 |
| Inner tubes ............. *no.* | 252 | 638 | 13,811 | 47,607 |
| Bicycle ............... *no.* | 79 | 24 | 14,165 | 3,905 |
| Mats and matting .......... | ...... | 8,273 | ...... | 78,288 |
| Cement .................... | ...... | 21,876 | ...... | 108,151 |
| Golf balls .......... *doz. prs.* | 2,340 | 5,008 | 16,676 | 32,307 |
| Heels ................. *prs.* | 13,245 | 759 | 68,634 | 4,793 |
| Other rubber manufactures.. | ...... | 180,868 | ...... | 1,658,576 |
| Totals ................. | ....... | $340,503 | ...... | $3,188,770 |
| Totals, rubber imports.. | ...... | $6,028,711 | ...... | $23,599,868 |

### Exports of Domestic and Foreign Rubber Goods

| UNMANUFACTURED | Produce of Canada Value | Reexports of Foreign Goods Value | Produce of Canada Value | Reexports of Foreign Goods Value |
|---|---|---|---|---|
| Crude rubber .............. | ...... | ...... | $73 | ...... |
| Waste rubber .............. | $25,700 | ...... | 188,985 | ...... |
| MANUFACTURED | | | | |
| Belting ................... | $73,338 | ...... | $324,354 | ...... |
| Bathing caps .............. | 242 | ...... | 3,033 | ...... |
| Canvas shoes with rubber soles. | 46,259 | ...... | 279,606 | ...... |
| Boots and shoes ............ | 142,861 | ...... | 1,076,976 | ...... |
| Clothing, including waterproofed ................. | 32,766 | ...... | 195,452 | ...... |
| Heels ..................... | 3,083 | ...... | 15,988 | ...... |
| Hose ...................... | 103,696 | ...... | 1,829,593 | ...... |
| Soles ..................... | 729 | ...... | 8,490 | ...... |
| Soling slabs ............... | 373 | ...... | 6,963 | ...... |
| Tires, pneumatic ........... | 596,908 | ...... | 3,251,303 | ...... |
| Not otherwise provided for. | 25,379 | ...... | 649,303 | ...... |
| Inner tubes .............. | 49,211 | ...... | 346,399 | ...... |
| Other rubber manufactures.. | 40,418 | ...... | 299,421 | ...... |
| Totals ................ | $1,115,263 | ...... | $8,286,881 | ...... |
| Totals rubber exports... | $1,140,963 | ...... | $8,475,939 | ...... |

## Dividends Declared

| COMPANY | STOCK | RATE | PAYABLE | STOCK OF RECORD |
|---|---|---|---|---|
| Armstrong Cork Co.......... | Com. | $0.25 interim | Dec. 1 | Nov. 3 |
| Armstrong Cork Co.......... | Pfd. | $1.00 q. | Dec. 15 | Dec. 1 |
| Dayton Rubber Mfg. Co. .... | Com. | $0.25 | Oct. 25 | Oct. 10 |
| Dayton Rubber Mfg. Co. .... | "A" | $0.50 q. | Oct. 25 | Oct. 10 |
| DeVilbiss Co. .............. | Com. | $0.50 | Oct. 15 | Sept. 30 |
| DeVilbiss Co. .............. | Pfd. | $0.175 q. | Oct. 15 | Sept. 30 |
| Firestone Tire & Rubber Co.. | Com. | $0.25 | Oct. 20 | Oct. 4 |
| General Cable Corp. ........ | Pfd. | $1.75 | Nov. 1 | Oct. 22 |
| General Electric Co. ........ | Com. | $0.35 | Oct. 25 | ....... |
| General Electric Co.......... | Com. | $0.35 | Dec. 20 | Nov. 14 |
| Goodyear Tire & Rubber Co.. | Com. | $0.375 | Dec. 15 | Nov. 15 |
| Goodyear Tire & Rubber Co.. | Pfd. | $1.25 q. | Dec. 15 | Nov. 15 |
| Lima Cord Sole & Heel Co.. | Com. | $0.20 | Oct. 31 | Oct. 15 |
| Midwest Rubber Reclaiming Co. ..................... | Com. | $1.50 | Oct. 28 | Oct. 15 |
| Pharis Tire & Rubber Co.... | Com. | $0.15 resumed | Nov. 25 | Nov. 10 |
| Plymouth Rubber Co., Inc... | 7% Pfd. | $1.75 q. | Oct. 15 | Oct. 10 |
| U. S. Rubber Reclaiming Co., Inc. .................... | 8% Pt. Pfd. | $0.50 | Oct. 15 | Oct. 10 |

## Labor Turnover in the Rubber Industry

Abstracted from "Part 10. Rubber and Its Products" for May, 1941, Industrial Reference Service, issued by the United States Department of Commerce, and of interest to rubber manufacturers are the tabulated statistics reproduced below, which are self-explanatory.

TABLE 1. LABOR TURNOVER IN ALL MANUFACTURING AND IN THE THREE BRANCHES OF THE RUBBER INDUSTRY, 1939 AND 1940[1]

| Industry | Separations | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quits | | Discharges | | Layoffs[2] | | Total | | Accessions | |
| | 1940 | 1939 | 1940 | 1939 | 1940 | 1939 | 1940 | 1939 | 1940 | 1939 |
| All manufacturing | 12.54 | 9.52 | 1.84 | 1.52 | 25.89 | 26.67 | 40.27 | 37.71 | 52.72 | 48.85 |
| Rubber industry | 10.23 | 7.61 | 1.04 | .86 | 21.61 | 21.78 | 32.88 | 30.25 | 42.02 | 38.75 |
| Tires and inner tubes | 6.70 | 5.90 | .63 | .72 | 17.75 | 13.44 | 25.08 | 20.06 | 30.73 | 32.62 |
| Rubber boots and shoes | 13.12 | 9.08 | 1.62 | .84 | 18.87 | 28.05 | 33.61 | 37.97 | 50.42 | 34.99 |
| Rubber products not otherwise classified | 15.22 | 9.88 | 1.37 | 1.21 | 33.18 | 33.93 | 49.77 | 45.02 | 58.97 | 57.11 |

[1] The various turnover rates represent the number of quits, discharges, layoffs, total separations, and accessions per 100 employes.
[2] Including temporary, indeterminate, and permanent layoffs.

TABLE 2. LABOR TURNOVER RATES IN THE RUBBER INDUSTRY, BY PRODUCT AND SIZE OF PLANT,[1] 1939 AND 1940

| Branch of Industry and Class of Turnover | Rate per 100 Employes in | | | |
|---|---|---|---|---|
| | 1940 | | 1939 | |
| | Small Plants | Large Plants | Small Plants | Large Plants |
| **Rubber Industry** | | | | |
| Separations | 58.54 | 22.82 | 61.43 | 20.57 |
| Quits | 15.69 | 6.38 | 9.78 | 6.94 |
| Discharges | 1.88 | .78 | 1.18 | .77 |
| Layoffs | 40.97 | 15.66 | 50.47 | 12.86 |
| Accessions | 71.14 | 33.06 | 64.66 | 30.69 |
| **Tires and Inner Tubes** | | | | |
| Separations | 37.08 | 22.17 | 29.28 | 18.21 |
| Quits | 10.31 | 5.83 | 8.69 | 5.34 |
| Discharges | 1.25 | .48 | .75 | .72 |
| Layoffs | 25.52 | 15.86 | 19.84 | 12.15 |
| Accessions | 29.71 | 30.98 | 31.05 | 32.93 |
| **Rubber Boots and Shoes** | | | | |
| Separations | 42.03 | 31.04 | 70.74 | 28.31 |
| Quits | 12.35 | 13.36 | 5.23 | 10.22 |
| Discharges | 2.68 | 1.30 | .53 | .93 |
| Layoffs | 27.00 | 16.38 | 64.98 | 17.16 |
| Accessions | 70.59 | 44.24 | 59.67 | 27.72 |
| **Miscellaneous Rubber Products** | | | | |
| Separations | 76.89 | 40.82 | 62.21 | 38.69 |
| Quits | 19.05 | 13.95 | 13.92 | 8.39 |
| Discharges | 2.32 | 1.06 | 1.38 | 1.15 |
| Layoffs | 55.52 | 25.81 | 46.91 | 29.15 |
| Accessions | 80.26 | 51.94 | 81.88 | 47.99 |

[1] "Large plants" include those having 1,000 or more employes, in the rubber industry as a whole and in footwear manufacture, 1,500 or over in tire manufacture, and 400 or over in the manufacture of miscellaneous products. Plants having less than these numbers of employes were classified as "small."

In the rubber industry as a whole the 32 smaller plants employed 14,234 workers in 1940 and 13,859 in 1939, and the 15 larger plants 46,244 in 1940 and 44,560 in 1939. In the tire branch of the industry the six smaller plants employed 6,257 in 1940 and 5,085 in 1939, and the six larger plants 25,646 in 1940 and 25,265 in 1939. In the rubber footwear branch the six smaller plants employed 3,400 in 1940 and 3,387 in 1939, and the three larger plants 11,093 in 1940 and 11,496 in 1939. In the manufacture of miscellaneous products the 15 smaller plants employed 3,496 in 1940 and 3,549 in 1939, and the ten larger plants 10,586 in 1940 and 9,637 in 1939.

## Imports by Customs Districts

| | July, 1941 | | July, 1940 | |
|---|---|---|---|---|
| | *Crude Rubber | | *Crude Rubber | |
| | Pounds | Value | Pounds | Value |
| Massachusetts | 18,603,042 | $3,370,898 | 9,973,355 | $1,757,139 |
| St. Lawrence | ...... | ...... | 2,260 | 401 |
| New York | 146,336,593 | 27,428,535 | 112,231,172 | 20,027,035 |
| Philadelphia | ...... | ...... | 939,833 | 159,612 |
| Maryland | 7,894,743 | 1,307,722 | 4,762,652 | 812,110 |
| Mobile | ...... | ...... | 886,490 | 147,418 |
| New Orleans | 9,254,848 | 1,641,789 | 8,894,201 | 1,505,653 |
| Galveston | ...... | ...... | 56,000 | 9,148 |
| San Antonio | ...... | ...... | 41,000 | 4,215 |
| Laredo | 112,000 | 12,250 | ...... | ...... |
| El Paso | 49,400 | 5,113 | 56,000 | 4,850 |
| Los Angeles | 28,462,984 | 5,354,915 | 13,642,168 | 2,374,064 |
| San Francisco | 6,748,177 | 1,200,304 | 556,998 | 101,148 |
| Oregon | ...... | ...... | 67,000 | 11,390 |
| Michigan | ...... | ...... | 10,153 | 1,726 |
| Ohio | 275 | 55 | 3,502,032 | 557,192 |
| Totals | 217,462,062 | $40,321,581 | 155,621,314 | $27,473,101 |

* Crude rubber including latex dry rubber content.

## United States Statistics

### Imports for Consumption of Crude and Manufactured Rubber

| | June, 1941 | | Six Months Ended June, 1941 | |
|---|---|---|---|---|
| | Quantity | Value | Quantity | Value |
| UNMANUFACTURED—*Free* | | | | |
| Liquid latex (solids)...... *lb.* | 4,637,095 | $936,944 | 29,417,591 | $5,776,001 |
| Jelutong or pontianak..... *lb.* | 1,236,620 | 179,779 | 9,105,201 | 1,382,705 |
| Balata .................. *lb.* | 150,991 | 30,470 | 727,951 | 165,231 |
| Gutta percha ............ *lb.* | 130,925 | 18,670 | 1,830,091 | 303,760 |
| Guayule ................. *lb.* | 857,400 | 86,949 | 5,142,000 | 527,536 |
| Scrap and reclaimed ..... *lb.* | 2,085,926 | 49,919 | 8,242,454 | 182,853 |
| Crepe soled rubber....... *lb.* | 28,908 | 6,714 | 249,399 | 55,732 |
| Totals ................ | 9,127,865 | $1,309,445 | 54,714,687 | $8,393,818 |
| Misc. rubber (above), 1,000 *lbs.* | 9,128 | $1,309,445 | 54,715 | $8,393,818 |
| Crude rubber ...... 1,000 *lbs.* | 139,158 | 25,179,498 | 1,034,402 | 184,781,792 |
| Totals ........ 1,000 *lbs.* | 148,286 | $26,488,943 | 1,089,117 | $193,175,610 |
| Chicle, crude ............ *lb.* | 503,439 | $173,075 | 9,657,659 | $3,632,542 |
| MANUFACTURED—*Dutiable* | | | | |
| Rubber tires ............ *no.* | 614 | $492 | 3,954 | $67,553 |
| Rubber boots, shoes and overshoes ............ *prs.* | 2,076 | 1,420 | 18,385 | 6,962 |
| Rubber soled footwear with fabric uppers ......... *prs.* | 80,743 | 15,681 | 541,961 | 108,233 |
| Golf balls ............... *no.* | 41,472 | 4,880 | 251,880 | 28,139 |
| Lawn tennis balls........ *no.* | 30,240 | 5,508 | 222,936 | 30,573 |
| Other rubber balls........ *no.* | 6,336 | 310 | 1,181,073 | 24,587 |
| Other rubber toys........... | ...... | 140 | ...... | 6,679 |
| Hard rubber combs...... *no.* | ...... | ...... | ...... | ...... |
| Other manufactures of hard rubber ................. | ...... | 114 | ...... | 169 |
| Friction or insulating tape.. *lb.* | 6,273 | 2,661 | 17,920 | 11,490 |
| Belts, hose, packing, and insulating material.......... | ...... | 10,719 | ...... | 50,734 |
| Druggists' sundries of soft rubber ................. | ...... | ...... | ...... | 1,711 |
| Inflatable swimming belts, floats, etc. ............ *no.* | 4,332 | 425 | 234,646 | 21,605 |
| Other rubber and gutta percha manufactures ..... | ...... | 12,257 | ...... | 73,508 |
| Totals ................. | ....; | $54,607 | ...... | $431,943 |

### Exports of Foreign Merchandise

| | June, 1941 Quantity | June, 1941 Value | Six Months Quantity | Six Months Value |
|---|---|---|---|---|
| RUBBER AND MANUFACTURES | | | | |
| Crude rubber ............ *lb.* | 1,066,148 | $257,254 | 4,540,985 | $1,007,013 |
| Balata .................. *lb.* | 25,328 | 8,898 | 155,176 | 62,323 |
| Other rubber, rubber substitutes and scrap ........ *lb.* | 2,965 | 803 | 16,771 | 4,651 |
| Rubber manufactures (including toys) ............ | ...... | 7,740 | ...... | 114,896 |
| Totals ................. | ...... | $274,695 | ...... | $1,188,883 |

### Exports of Domestic Merchandise

| | June, 1941 Quantity | June, 1941 Value | Six Months Quantity | Six Months Value |
|---|---|---|---|---|
| RUBBER AND MANUFACTURES | | | | |
| Reclaimed ............... *lb.* | 1,965,993 | $102,147 | 12,856,156 | $673,251 |
| Scrap ................... *lb.* | 1,478,723 | 18,977 | 31,757,035 | 482,055 |
| Cements ................ *gal.* | 20,566 | 16,804 | 168,295 | 161,587 |
| Rubberized auto cloth. *sq. yd.* | 9,187 | 4,222 | 155,794 | 71,058 |
| Other rubberized piece goods and hospital sheetings. *sq. yd.* | 242,945 | 72,815 | 1,792,829 | 830,173 |
| Boots .................. *prs.* | 7,379 | 18,366 | 51,425 | 119,858 |
| Shoes .................. *prs.* | 10,523 | 10,999 | 116,664 | 79,924 |
| Canvas shoes with rubber soles .............. *prs.* | 84,003 | 59,216 | 460,188 | 350,227 |
| Soles .............. *doz. prs.* | 8,721 | 13,996 | 48,881 | 63,305 |
| Heels .............. *doz. prs.* | 26,139 | 15,555 | 190,343 | 101,956 |
| Soling and top lift sheets.. *lb.* | 30,820 | 8,012 | 200,925 | 46,657 |
| Gloves and mittens.. *doz. prs.* | 3,877 | 10,272 | 50,045 | 105,750 |
| Water bottles and fountain syringes .............. *no.* | 33,644 | 11,076 | 253,843 | 82,201 |
| Other druggists' sundries.... | ...... | 88,608 | ...... | 540,502 |
| Gum rubber clothing.... *doz.* | 8,870 | 30,339 | 94,656 | 236,641 |
| Balloons .............. *gross* | 17,989 | 17,364 | 105,526 | 91,512 |
| Toys and balls ............ | ...... | 11,067 | ...... | 64,289 |
| Bathing caps ........... *doz.* | 3,729 | 6,518 | 23,671 | 43,019 |
| Bands .................. *lb.* | 9,548 | 5,086 | 83,194 | 38,377 |
| Erasers ................. *lb.* | 15,670 | 9,091 | 125,341 | 71,873 |
| Hard rubber goods | | | | |
| Electrical battery boxes. *no.* | 20,826 | 13,481 | 171,848 | 130,889 |
| Other electrical ........ *lb.* | 41,899 | 11,693 | 251,604 | 78,246 |
| Combs, finished ...... *doz.* | 35,460 | 16,220 | 184,636 | 90,386 |
| Other hard rubber goods.... | ...... | 16,697 | ...... | 125,400 |
| Tires | | | | |
| Truck and bus casings.. *no.* | 54,140 | 1,421,439 | 394,300 | 9,137,613 |
| Other auto casings..... *no.* | 51,150 | 594,424 | 385,302 | 4,826,601 |
| Tubes, auto ........... *no.* | 83,623 | 177,398 | 584,681 | 1,313,706 |
| Other casings and tubes.. *no.* | 12,243 | 64,608 | 130,439 | 1,321,398 |
| Solid tires for automobiles and motor trucks..... *no.* | 349 | 9,676 | 2,415 | 58,914 |
| Other solid tires........ *lb.* | 84,212 | 10,099 | 492,038 | 79,044 |
| Tire sundries and repair materials ............... *lb.* | 130,329 | 41,738 | 1,484,878 | 429,115 |
| Rubber and friction tape.. *lb.* | 54,861 | 17,635 | 352,846 | 106,671 |
| Fan belts for automobiles. *lb.* | 25,176 | 15,788 | 213,438 | 107,216 |
| Other rubber and balata belts ................... *lb.* | 282,841 | 125,741 | 1,749,333 | 909,792 |
| Garden hose ............ *lb.* | 45,504 | 9,115 | 294,098 | 57,959 |
| Other hose and tubing.... *lb.* | 586,752 | 296,581 | 3,798,444 | 1,710,966 |
| Packing ................. *lb.* | 142,001 | 56,977 | 827,194 | 357,256 |
| Mats, matting, flooring, and tiling ................. *lb.* | 137,002 | 20,683 | 776,424 | 108,296 |
| Thread .................. *lb.* | 18,189 | 17,000 | 169,696 | 157,486 |
| Gutta percha manufactures. *lb.* | 23,894 | 8,706 | 350,495 | 116,921 |
| Latex (d.r.c.) and rubber sheets processed for further manufacture ...... *lb.* | 298,874 | 56,274 | 1,111,301 | 217,212 |
| Synthetic rubber (bulk)... *lb.* | 24,415 | 10,251 | 584,795 | 300,483 |
| Other rubber manufactures.. | ...... | 153,077 | ...... | 986,170 |
| Totals ................. | ...... | $3,695,831 | ...... | $26,981,958 |

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★ So far we have no priorities and no price-fixing in scrap rubber. There will be no need of such action as long as we keep the supply of scrap constantly flowing into national industry . . . as long as scrap is sold freely and at a fair price.

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